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LIST OF PAPERS.

Page

ADAMS, ARTHUR, F.L.S. &c.

On the Species of *Pyramidellinæ* found in Japan 1

On the Japanese Species of *Leiostraca* 84

On the Species of Rostriferous Gasteropods (*Strombidæ, Trichotropidæ, Cyprœidæ*, and *Amphiperasidæ*) found in Japan 91

On the Species of *Fusidæ* which inhabit the Seas of Japan 105

On the Species of *Mitridæ* found in the Seas of Japan 198

BLACKWALL, JOHN, F.L.S.

A succinct Review of recent Attempts to explain several remarkable Facts in the Physiology of Spiders and Insects 154

M'INTOSH, W. CARMICHAEL, M.D., F.L.S.

Notes on the Food and Parasites of the *Salmo Salar* of the Tay 145

MURRAY, ANDREW, F.L.S.

On the early Stages of Development of Orthopterous Insects .. 97

SMITH, FREDERICK, Esq.

Catalogue of Hymenopterous Insects collected by Mr. A. R. Wallace in the Islands of Mysol, Ceram, Waigiou, Bouru, and Timor 6

Notes on the Geographical Distribution of the Aculeate Hymenoptera collected by Mr. A. R. Wallace in the Eastern Archipelago 109

WALKER, FRANCIS, F.L.S.

Catalogue of the Heterocerous Lepidopterous Insects collected at Sarawak, in Borneo, by Mr. A. R. Wallace, with Descriptions of New Species 49, 160

Catalogue of the Dipterous Insects collected in Waigiou, Mysol, and North Ceram, by Mr. A. R. Wallace, with Descriptions of New Species 202

INDEX 239

JOURNAL OF THE PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

On the Species of *Pyramidellinæ* found in Japan. By Arthur Adams, F.L.S., &c. Received September 11, 1862.

[Read Nov. 6, 1862.]

I have not met with a single species of *Pyramidella*, s. str., in Japan. The small plicate species with a single plait, separated under the name of *Parthenia* by Lowe, and the pupoid forms arranged by P. P. Carpenter under the head of *Chrysallida* are the most numerous of the subfamily. Besides these, I recognize a thin, turreted form, which I call *Pyrgulina*; an ovate-cancellate group, which is named *Mumiola*; a plicate form, with a spiral axis, which is my *Mormula*; and a little group, solid, and half costate, half lirate, which I designate *Miralda*.

Gen. Mormula, *A. Ad.*

Testa subulato-turrita, rissoidea, solida, crassa, longitudinaliter plicata. *Apertura* magna; labio spiraliter tortuoso; labro intus incrassato, margine acuto.

1. Mormula rissoina, *A. Ad.*

M. testa subulato-turrita, solida, in medio tumidula, albida, fasciis duabus transversis rufescentibus sæpe ornata; anfractibus normalibus 7, planiusculis, longitudinaliter plicatis, plicis crassis vix undulatis, nonnullis

variciformibus, interstitiis valde liratis; apertur asubquadrata; labio recto, spiraliter tortuoso; labro intus incrassato, margine acuto.

Hab. O-Sima; Takano-Sima.

This is a singular-banded shell, very much resembling a *Rissoina*; but the inner lip is spirally twisted, and the nucleus is sinistral.

2. Mormula egregia, *A. Ad.*

M. testa subulato-turrita, crassa, solida, rissoida, carneola, rufo fasciata; anfractibus normalibus 8, planis, longitudinaliter valde costatis, transversim totis liratis, fasciis tribus transversis rufis ornatis; apertura subquadrato-ovata; labio spiraliter tortuoso; labro intus incrassato, extus varicoso, margine arcuato, acuto.

Hab. Delaguete; Philippines.

I have introduced this singular Rissoid-looking shell here, although not from Japan, as a second species of *Mormula*. It appears to agree congenerically with *M. rissoina*; but the nucleolar whorls are unfortunately broken off.

Gen. Chrysallida, *Cpr.*

The species enumerated and described in this communication are all from Japan.

1. Chrysallida plicata, *A. Ad. Annals Nat. Hist.* 1860.
Hab. Mino-Sima; Gotto; O-Sima.

2. Chrysallida consimilis, *A. Ad. Annals Nat. Hist.* 1861.
Hab. O-Sima; Takano-Sima.

3. Chrysallida pupula, *A. Ad. Annals Nat. Hist.* 1861.
Hab. Tsu-Sima, 26 fathoms.

4. Chrysallida alveata, *A. Ad. Annals Nat. Hist.* 1861.
Hab. Tsu-Sima; Takano-Sima.

5. Chrysallida consobrina, *A. Ad. Annals Nat. Hist.* 1861.
Hab. Awa-Sima; Gotto.

6. Chrysallida nana, *A. Ad. Annals Nat. Hist.* 1861.
Hab. Tsu-sima, 26 fathoms.

7. Chrysallida mumia, *A. Ad. Annals Nat. Hist.* 1861.
Hab. Gotto, 48 fathoms.

8. Chrysallida mundula. *A. Ad.* (Parthenia mundula, *Annals Nat. Hist.* 1861).
Hab. Sado; O-Sima.

9. Chrysallida munda, *A. Ad. Annals Nat. Hist.* 1861.
Hab. Korea Strait.

10. Chrysallida filocincta, *A. Ad.*

C. testa elongato-ovali, albida, linea rufa (in anfractu ultimo lineis duabus) ornata; anfractibus normalibus 5, convexiusculis, longitudinaliter pli-

catis, plicis subconfertis, interstitiis punctatis, plicis in anfractu ultimo ad peripheriam evanidis; apertura ovata, antice effusa, plica columellari obliqua.

Hab. O-Sima.

More ovate than *M. rufolineata*, and the interstices obscurely punctate.

11. Chrysallida rufolineata, *A. Ad.*

C. testa elongato-turrita, albida, nitida, linea rufa (in anfractu ultimo lineis duabus) ornata; anfractibus normalibus 6, planis, in medio excavatis, longitudinaliter plicatis, plicis subdistantibus, interstitiis lævibus, suturis crenulatis, plicis in anfractu ultimo ad peripheram evanidis; apertura subquadrato-ovato, antice effusa, plica parietali obliqua.

Hab. Gotto, 48 fathoms.

12. Chrysallida galbula, *A. Ad.*

C. testa elongato-ovata, pupoidea, in medio tumida, apice obtusiusculo, lactea, nitida; anfractibus normalibus 6, tabulatis, transversim liratis, in medio concaviusculis, superioribus longitudinaliter plicatis, inferioribus lævibus; apertura ovata; labio incrassato, plica parietali mediana, transversa; labro intus sulcato.

Hab. Gotto, 48 fathoms.

A little pupoid, semiplicate species, with the whorls transversely grooved internally.

13. Chrysallida erucella, *A. Ad.*

C. testa elongata, pupiformi, badia; anfractibus normalibus 7, planis, longitudinaliter costatis, costis validis, rectis, confertis, interstitiis simplicibus; apertura ovato-oblonga, plica parietali obliqua, conspicua.

Hab. Seto-Uchi; O-Sima; Takano-Sima.

A neatly fashioned, brown species, with strong ribs, and with the interstices plain.

Gen. Miralda, *A. Ad.*

Testa solida, ovata, seu elongata; anfractibus planis, postice plicatis, antice transversim liratis. *Apertura* labro postice subangulato, margine crenato.

1. Miralda diadema, *A. Ad.* (Parthenia diadema, *Annals N. H.* 1860).

Hab. Mino-Sima; Seto-Uchi; Uraga.

2. Miralda Mariella, *A. Ad.* (Parthenia Mariella, *Ann. N. H.* 1860).

Hab. Mino-Sima; Gotto; Tsu-Sima; Seto-Uchi.

3. Miralda gemma, *A. Ad.* (Parthenia gemma, *Ann. N. H.* 1861).

Hab. Tsu-Sima; Seto-Uchi; Akasi.

Gen. Parthenia, *Lowe.*

Testa tenuis, pyramidata seu turrita; anfractibus longitudinaliter costellatis, costellis, in anfractu ultimo, ad peripheriam evanidis. *Apertura* ovata; labro in medio subangulato; labio plica unica instructo.

1. Parthenia monocycla, *A. Ad. Annals Nat. Hist.* 1860.
Hab. Mino-Sima; Gotto; O-Sima; Tanabe.

2. Parthenia spirata, *A. Ad. Annals Nat. Hist.* 1860.
Hab. Mino-Sima.

3. Parthenia littoralis, *A. Ad. Annals Nat. Hist.* 1861.
Hab. Tsu-Sima, on oysters, low water.

4. Parthenia punctigera, *A. Ad. Annals Nat. Hist.* 1860.
Hab. Gotto; Sado.

5. Parthenia semiplicata, *A. Ad.* (Chrysallida semiplicata, *Annals*, 1860).
Hab. Gotto; O-Sima; Takano-Sima.

6. Parthenia pusio, *A. Ad.* (Chrysallida pusio, *Annals Nat. Hist.* 1861).
Hab. Tsu-Sima; O-Sima.

7. Parthenia pagodula, *A. Ad.* (Turbonilla monocycla, *A. Ad. Annals Nat. Hist.* 1860).
Hab. Mino-Sima; Taku-Sima; Takano-Sima.

8. Parthenia foveolata, *A. Ad. Annals Nat. Hist.* 1860.
Hab. Mino-Sima.

9. Parthenia cælata, *A. Ad.*
M. testa pyramidato-turrita, alba, solida; anfractibus normalibus 8, planatis, longitudinaliter costatis, costis rectis, interstitiis valde punctatis; cingula transversa, conspicua, ad suturas ornatis; anfractu ultimo ad peripheriam angulato, basi cingulis tribus, validis, concentricis instructo; apertura subquadrata, plica columellari transversa, conspicua, acuta.
Hab. Seto-Uchi; Akasi; Tsu-Sima.

This is a very regular, strongly-marked species, found principally at Akasi, in the Inland Sea. The form is elongately pyramidal, and the whorls are ribbed and lirate, the lower portions being encircled with a concentric elevated zone, and the last whorl at the base being furnished with three similar zones.

Gen. Pyrgulina, *A. Ad.*

Testa tenuis, ovato-turrita; anfractibus spiratis, postice angulatis, longitudinaliter plicatis. *Apertura* ovata; labro margine postice angulato.

1. Pyrgulina casta, *A. Ad.* (Chrysallida casta, *Annals Nat. Hist.* 1861.
Hab. Takano-Sima.

2. Pyrgulina Minna, *A. Ad.* (Chrysallida Minna, *Annals*, 1860.)
Hab. Mino-Sima; Gotto,

3. Pyrgulina Brenda, *A. Ad.* (Chrysallida Brenda, *Annals*, 1860).
Hab. Takano-Sima; O-Sima.

4. Pyrgulina elegantula, *A. Ad.* (Chrysallida elegantula, *Annals*, 1860).
Hab. Mino-Sima; Seto-Uchi.

5. Pyrgulina pygmæa, *A. Ad.* (Chrysallida pygmæa, *Annals*, 1861).
Hab. Mino-Sima; Gotto.

6. Pyrgulina pulchella, *A. Ad.* (Chrysallida pulchella, *Annals*, 1860).
Hab. Gotto; Mino-Sima; Seto-Uchi; Akasi.

7. Pyrgulina concinna, *A. Ad.* (Chrysallida concinna, *Annals*, 1860).
Hab. Mino-Sima.

8. Pyrgulina miranda, *A. Ad.* (Chrysallida miranda, *Annals*, 1861).
Hab. Yobuko.

9. Pyrgulina bellula, *A. Ad.* (Parthenia bellula, *Annals*, 1860).
Hab. Tabu-Sima, 24 fathoms.

10. Pyrgulina fenestrata, *A. Ad.* (Parthenia fenestrata, *Annals*, 1860).
Hab. Mino-Sima.

11. Pyrgulina pura, *A. Ad.* (Chrysallida pura, *A. Ad. Annals*, 1861).
Hab. Awa-Sima; Takano-Sima.

12. Pyrgulina tantilla, *A. Ad.*
P. testa tenui, turrita, alba, semipellucida; anfractibus normalibus 4, convexiusculis, postice vix angulatis, longitudinaliter plicatis, plicis undulatis, subconfertis, interstitiis concinne clathratis, suturis profundis; apertura ovata, plica columellari conspicua.
Hab. O-Sima; Tanabe; Takano-Sima.
A very pretty little species, semitransparent, and neatly sculptured.

13. Pyrgulina decussata, *A. Ad.*
P. testa ovato-turrita, rimata, tenui; anfractibus normalibus 4, planatis, postice rotundato-angulatis, costellis tenuibus confertis longitudinalibus et lineis elevatis transversis decussatis; apertura quadrato-ovata; labio subrecto; plica columellari cælata.
Hab. Gotto, 48 fathoms.
In this species the longitudinal ribs are very fine and close together, and are crossed by transverse lines.

Gen. Mumiola, *A. Ad.*

Testa tenuis, elongata seu ovata; anfractibus convexis, cancellatis aut granulosis. *Apertura* ovata; labro margine regulariter arcuato.

1. Mumiola spirata, *A. Ad.* (Monoptygma spirata, *A. Ad. Sow. Thes. Monopt.* pl. 172. figs. 26, 27.)
Hab. O-Sima.

2. Mumiola reticosa, *A. Ad.*
M. testa tenui, rimata, acuminato-ovata; anfractibus normalibus 4, convexis, lineis elevatis transversis et longitudinalibus decussatis; apertura ovata; labio plica postica, transversa, valida; labro simplici, arcuato.
Hab. Seto-Uchi.

The cancellation in this species is much finer than in *M. spirata*, and the whorls are not angulate at the sutures.

3. Mumiola tessellata, *A. Ad.*

M. testa ovata, rimata, sordide alba, anfractibus normalibus 5, planiusculis, liris granosis longitudinalibus confertis, et sulcis validis transversis concinne tessellatis; apertura ovato-oblonga, plica columellari transversa, valida, mediana.

Hab. Tanabe; O-Sima.

An ovate, tessellated species, of very neat form, and peculiar style of sculpture.

Catalogue of Hymenopterous Insects collected by Mr. A. R. Wallace in the Islands of Mysol, Ceram, Waigiou, Bouru and Timor.

By Frederick Smith, Assistant in the Zoological Department, British Museum. Communicated by W. W. Saunders, Esq., F.R.S. & L.S.

[Read Jan. 15, 1863.]

It will be observed, on comparing the contents of the present collection with others described in previous papers, that the species most widely distributed belong to the families *Vespidæ* and *Sphegidæ*, both containing insects of powerful flight; whilst among the apterous genera, or those in which the females are only temporarily winged, as in the *Formicidæ*, the range of distribution is much more circumscribed; it is, consequently, here that the largest number of new species are found.

In this paper, no less than four new species of the family *Thynnidæ* are described, one belonging to the genus *Ælurus*, the first, I believe, that has occurred out of Australia. We hope shortly to be enabled to draw up a set of tables showing the range of geographical distribution of the numerous species of Hymenoptera described in the various previous papers on the insects of the Eastern Archipelago.

Fam. EVANIDÆ, *Leach.*

Gen. Megischus, *Brullé.*

1. Megischus tarsalis, *Smith, Proc. Linn. Soc.* v. 137. 2.
Hab. Ceram; Bachian.

2. Megischus viduus, *Smith, Proc. Linn. Soc.* v. 138. 3.
Hab. Kaisaa; Ceram.

3. Megischus spoliator. *M.* niger, mandibulis et antennarum

basi rufis; thorace rugoso; pedibus anticis et intermediis ferrugineis, tarsis posterioribus rubris; alis hyalinis.

Female. Length 7 lines. Black; the mandibles, palpi, and five basal joints of the antennæ ferruginous; the face rugose; the front with three short acute tubercles placed in a triangle, behind which the head is transversely rugulose; behind the eyes is a broad cream-coloured stripe, which extends to the base of the mandibles. The thorax rugose, with large punctures on the metathorax; the anterior and intermediate legs ferruginous, the coxæ of the latter black; the posterior tarsi ferruginous. Abdomen: the first segment, which forms the petiole, transversely striated; the rest of the abdomen smooth and shining; the ovipositor more than one-third longer than the body; the wings hyaline, the nervures black.

Hab. Waigiou.

4. Megischus insidiator. *M.* niger, capite et antennarum basi rufis; pedibus anticis et intermediis obscure ferrugineis, tarsis posterioribus pallide rubris; alis subhyalinis.

Male. Length 9 lines. The head and base of the antennæ ferruginous; the former transversely striated, with the posterior margin of the vertex smooth and shining, or with a few distant punctures. Thorax strongly, but not closely punctured; the wings fusco-hyaline; the anterior and intermediate tibiæ rufo-testaceous, with the femora obscurely so; the posterior femora with two stout teeth beneath and six minute ones between them; the posterior tibiæ, at their apex, and the tarsi pale rufo-testaceous. The abdomen elongate, lanceolate at the apex, and entirely smooth and shining.

Hab. Mysol.

Fam. ICHNEUMONIDÆ, *Leach.*

Gen. Cryptus, *Fabr.*

1. Cryptus albopictus, *Smith, Proc. Linn. Soc.* v. 61. 3.

Hab. Mysol; Makassar.

2. Cryptus volatilis. *C.* ferrugineus, antennis nigris, medio albis; alis hyalinis.

Female. Length 7 lines. Ferruginous; the flagellum black, with the seventh and five following joints white; the claw-joint of the tarsi fuscous; the wings hyaline, the nervures fuscous, the costa and stigma ferruginous.

Hab. Mysol.

3. Cryptus tarsatus. *C.* ferrugineus, antennis tarsisque nigris; alis hyalinis, apice fusco fumatis.

Male. Length 6⅓ lines. Ferruginous, inclining to ochraceous; the thorax beneath, the metathorax, and base of the legs pale ochraceous; the flagellum, posterior tarsi, and the apical joints of the anterior and

intermediate pair black; the wings hyaline, with a fuscous cloud beyond the base of the marginal cell.

Hab. Mysol.

This species very closely resembles the *C. sicarius* from Bachian: it is probably the male of that insect.

Gen. Mesostenus, *Brullé.*

1. Mesostenus multipictus. *M.* niger, capite thoraceque albo pictis; segmentis abdominalibus albo marginatis; pedibus nigro, albo et ferrugineo lavatis; alis hyalinis.

Female. Length 7 lines; ovipositor 4½ lines. Black; a spot on the labrum, an irregular transverse line on the face at the insertion of the antennæ, a line on the cheeks, and another behind the eyes white; the seventh and four following joints of the antennæ white. An ovate spot on the disk of the mesothorax, the tegulæ, scutellum, a spot at the base and apex of the metathorax, and another on each side white; two white spots beneath the wings; the legs spotted and striped with white and black, also coloured with ferruginous tints. The abdomen annulated with white, more or less inclining to ochraceous; some of the bands attenuated or slightly interrupted in the middle; the wings hyaline.

Hab. Mysol.

2. Mesostenus pulcherrimus. *M.* niger, antennis medio albis; capite thoraceque albo punctatis; abdominis fasciis albis; alis hyalinis.

Female. Length 5½ lines. Black; two angular spots on the vertex, uniting in front of the ocelli, and five joints in the middle of the antennæ white. Thorax: a semicircular spot on the disk, the scutellum, the spines on the metathorax, two spots on the sides, the anterior and intermediate coxæ, a spot on the posterior pair, the trochanters, the anterior and intermediate tibiæ outside, the base of the posterior pair, and the second and third joints of the intermediate and posterior tarsi white; the posterior femora with a fulvous stripe outside, and a white one within; the anterior femora fulvous, with a white stripe beneath; the intermediate pair are fulvous above and black beneath; wings hyaline and iridescent; the nervures black. Abdomen shining; all the segments, except the fifth and six, annulated with white on their posterior margins; the ovipositor shorter than the abdomen.

Hab. Waigiou.

Gen. Pimpla, *Fabr.*

1. Pimpla braconoides, *Smith, Proc. Linn. Soc.* iii. 172. 2 (*var.*).

Hab. Mysol; Key Island.

2. Pimpla arrogans. *P.* ferrugineo-lutea, antennis strigisque tribus thoracis nigris; alis hyalinis, apice unimaculato.

Female. Length 9 lines; of ovipositor 4 lines. Reddish yellow, pale beneath; the face, clypeus, and front of the scape yellow; the antennæ

black, beneath obscurely rufo-fuscous; the thorax with three longitudinal black stripes, and, as well as the abdomen, closely punctured; the apical margins of the latter incrassate, smooth, and shining; legs stout; femora incrassate; the tips of the claws of the tarsi black; wings hyaline, with a dark brown macula at the apex of the marginal cell.

Hab. Ceram.

3. PIMPLA APICALIS. *P.* flavo-rufa, scapo supra nigro; alis hyalinis; abdominis segmentis duobus apicalibus nigris.

Male. Length 7 lines. Reddish-yellow; the face and the mandibles yellow; the scape above, a minute spot on the disk of the thorax, and the two apical segments of the abdomen black; the thorax shining and smooth; the metathorax with a semicircular space at its base enclosed by an elevated carina, from which two oblique carinæ run on each side to a lateral carina, which extends from the base to the apex. Abdomen closely punctured, each segment having a transverse curved line; the basal segment impunctate.

Hab. Ceram.

4. PIMPLA INSIDIATOR. *P.* rufo-flava, abdomine supra nigro, segmentis flavo marginatis; mesothorace nigro trivittato; alis hyalinis, apice cellulæ marginalis fusco unimaculato.

Female. Length 6 lines; of the ovipositor 2½ lines. Reddish yellow; antennæ fuscous above and ferruginous beneath; the face testaceous yellow; a spot in front of the ocelli, and three longitudinal stripes on the thorax black; the wings hyaline, with a dark brown macula at the apex of the marginal cell. Abdomen black above, the basal and apical segments reddish yellow, the apical margins of all the segments yellow; the pectus black. The *male* differs in having the abdomen reddish yellow, the margins pale, with the base of the third and fourth segments black, the fifth and sixth entirely black, and the base only of the apical one black.

Hab. Mysol.

5. PIMPLA DESTRUCTOR. *P.* rufo-flava, antennis tarsisque et abdominis segmentis posterioribus nigris, marginibus apicalibus fasciis flavis; alis hyalinis.

Female. Length 5 lines. Reddish yellow; the face, mandibles, and cheeks pale yellow; the antennæ black, with the scape yellow in front; the claws of the anterior tarsi, the claw-joint of the intermediate pair, and the tarsi and apex of the posterior tibiæ fuscous; the wings hyaline, the nervures dark brown; the mesothorax with two longitudinal pale lines. Abdomen: the two basal segments yellow, the rest black, with their apical margins yellow.

Hab. Mysol.

6. PIMPLA INCISA. *P.* nigra, capite, thorace pedibusque anticis et intermediis ferrugineis; alis nigro-fuscis.

Female. Length 8 lines; the ovipositor as long as the body. The head, scape of the antennæ, thorax, anterior and intermediate legs ferruginous, smooth and shining; the face yellow; the flagellum black; the wings dark brown. Abdomen elongate, attenuated at the base and apex; the margins of the segments deeply constricted, and each segment, excepting the basal and two apical ones, with a transverse deeply impressed curved line; rather strongly and regularly punctured.
Hab. Ceram.

7. Pimpla inimica. *P.* flavo-rufa, antennis tarsisque posterioribus nigris; alis hyaliuis, iridescentibus.
Female. Length 5 lines. Yellowish red; the antennæ black, with the scape ferruginous; the pectus yellow; the wings hyaline, with a yellowish tinge; the nervures ferruginous. Abdomen: the margins of the segments paler than the other parts; the ovipositor black.
Hab. Mysol.

8. Pimpla caudata. *P.* lutea; antennis supra fuscis; abdominis segmentis utrinque puncto nigro; ovipositore nigro.
Female. Length $4\frac{1}{2}$ lines. Pale yellow, the abdomen darkest; the scape yellow in front; the flagellum fulvous beneath, above fuscous; the thorax immaculate; the wings hyaline, with the nervures black; the legs incrassate. Abdomen: the third, fourth, and fifth segments with a minute black spot on each side; the seventh with a minute black transverse spot on each side, at the basal margin; the ovipositor black.
Hab. Mysol.

Gen. Rhyssa, *Grav.*

1. Rhyssa vestigator, *Smith, Proc. Linn. Soc.* iii. 174. 2.
Hab. Mysol; Aru.

2. Rhyssa viator. *R.* nigra, capite thoraceque flavo variis, abdomine pedibusque ferrugineis; alis hyalinis, macula fusca ad apicem.
Male. Length $9\frac{1}{2}$ lines. Black; the thorax above transversely rugulose; the face and orbits of the eyes yellow; the posterior margin of the prothorax and a spot beneath the wings yellow; the anterior coxæ yellow beneath; the legs ferruginous, with the intermediate and posterior coxæ, the posterior femora, and the intermediate pair above black; the wings hyaline; the nervures black, with a narrow brown stripe crossing at the middle of the marginal cell and terminating in the second submarginal cell. Abdomen smooth, shining, and obscurely ferruginous, becoming black at the base; the apical margins of the segments bright ferruginous.
Hab. Mysol.

Gen. Glypta, *Grav.*

1. Glypta fracticornis. *G.* viridi-cyanea, antennæ pedibusque albo annulatis; alis anticis fascia transversa fusca.

Female. Length $4\frac{3}{4}$ lines. Bright-green, shining; the thorax with rather distant punctures on the disk; the scutellum and metathorax more strongly punctured; the second and third segments with oblique depressions, the first and second punctured. The antennæ, from the eleventh to the seventeenth joints, white, elbowed at the eighteenth, and from thence tapering to a point. The anterior legs, trochanters, base of the tibiæ, and the tarsi white, the apical joint of the latter black; the wings hyaline; the stigma white, the apical half black; the base of the costal nervures white; a fuscous line runs along the apical portion of the externo-medial cell; a fuscous stain also runs from the base of the marginal cell nearly across the anterior wings; the apical margins of the third and seventh segments of the abdomen with a white fascia. The *male* differs in having the antennæ simple, the wings without fasciæ, the body more elongate, and the abdomen without white marginal fasciæ.

Hab. Mysol.

Fam. BRACONIDÆ, *Westw.*

Gen. Bracon, *Fabr.*

1. Bracon occultator. *B.* rufescenti-flavus, antennis et ovipositore nigris; alis fuscis, macula hyalina.

Female. Length 5 lines. The head, thorax, and legs of a clay-coloured yellow; the abdomen of a ferruginous yellow; the antennæ black, with the scape yellow; the wings dark fuscous, yellow at the base, with a subhyaline yellow macula beyond the stigma, the nervures testaceous, with the stigma black. The first segment of the abdomen with a deep channel on each side; the second and third segments with a central longitudinal carina; the second has besides this a lateral abbreviated carina on each side at its base, and is also irregularly longitudinally striated; the basal half of the third segment is also striated; the ovipositor black and as long as the thorax and abdomen.

Hab. Mysol.

2. Bracon penetrator. *B.* niger, capite, thorace pedibusque anticis et intermediis ferrugineis; alis nigro-fuscis, macula hyalina.

Female. Length 6 lines. The head, thorax, anterior and intermediate legs ferruginous; the head has a yellowish tinge; the antennæ black, with the scape yellow; wings dark brown, with a small hyaline macula beyond the discoidal cells, their extreme base reddish yellow; the posterior legs have the coxæ, trochanters, and knees ferruginous. The first segment of the abdomen with a deep longitudinal channel on each side, and a central carina; the second segment coarsely and irregularly striated at the base, and a longitudinal channel at the lateral margins.

Hab. Mysol.

Gen. Agathis, *Latr.*

1. Agathis deceptor. *A.* ferruginea, abdomine longitudinaliter striato, apice nigro; alis flavo-hyalinis, apice late fuscis.

Female. Length 6 lines. Ferruginous; the eyes, antennæ, and two apical segments of the abdomen black; the first, second, and third segments of the abdomen strongly and evenly grooved or striated longitudinally; the ovipositor ferruginous, the valves black; the wings yellow-hyaline, with a broad, dark fuscous apical border.

Hab. Ceram.

2. Agathis flavipennis. *A.* ferruginea, abdominis segmentis supra longitudinaliter striatis; alis flavo-hyalinis, fusco maculatis.

Female. Length $5\frac{1}{2}$ lines. Ferruginous; the face, anterior legs, and the intermediate coxæ paler than the body; the four basal segments of the abdomen longitudinally striated; the ovipositor ferruginous, with the valves black; the wings yellow, their apical margins slightly fuscous, with an ovate brown macula beneath the stigma.

Hab. Ceram.

Gen. Cenocœlius, *Haliday.*

1. Cenocœlius insidiator. *C.* capite, thorace, pedibus anterioribus et intermediis ferrugineis; alis fuscis; metathorace pube cinerea tecto; abdomine nitide nigro.

Female. Length $4\frac{3}{4}$ lines. Head and thorax ferruginous, the former subquadrate, wider than the thorax, smooth and shining; the antennæ black; the face thinly covered with white pubescence. Thorax rough and pubescent; the scutellum smooth, shining, and elevated; the metathorax black, and densely covered with white pubescence; the wings dark brown, with the nervures black; the anterior and intermediate legs red, the posterior pair black. Abdomen black, smooth, shining, and impunctate; the basal segment with a short petiole and a deep impression on each side at its apical margin above.

Hab. Mysol.

Fam. FORMICIDÆ, *Leach.*

Gen. Formica, *Linn.*

1. Formica coxalis, *Smith, Proc. Linn. Soc.* iii. 136. 5.

Hab. Waigiou; Aru; Mysol.

2. Formica fragilis, *Smith, Proc. Linn. Soc.* iii. 136. 3.

Hab. Waigiou; Aru.

3. Formica circumspecta, *Smith, Proc. Linn. Soc.* vi. 37. 4.

Hab. Waigiou; Celebes.

4. Formica quadriceps, *Smith, Proc. Linn. Soc.* iii. 137. 9.

Hab. Ceram; Aru.

5. Formica pallida, *Smith, Proc. Linn. Soc.* ii. 57. 19.

Hab. Martabello; Timor: Bachian; Borneo; Sumatra.

6. Formica nitida, *Smith, Proc. Linn. Soc.* iii. 138. 11.
Hab. Mysol; Aru.

7. Formica pavida, *Proc. Linn. Soc.* v. 96. 9.
Hab. Mysol; Bachian.

8. Formica lævissima, *Smith, Proc. Linn. Soc.* iii. 138. 10.
Hab. Waigiou; Aru; Bachian.

9. Formica longiceps. *F.* nigra, sparse griseo pilosa; capite oblongo, antennis tarsisque rufo-testaceis; thorace postice attenuato; abdominis squamula incrassata, supra rotundata.

Worker. Length 3 lines. Black, and thinly covered with a short griseous pile; the head oblong-quadrate, slightly narrowed anteriorly; the maudibles short, very stout, and denticulate on their inner margin; the antennæ ferruginous, with the apical half of the scape black; the front with a slightly impressed line down the centre. Thorax oblong, narrowed posteriorly, and slightly compressed; the prothorax rounded in front, its posterior margin slightly constricted; the articulations of the legs and the tarsi rufo-testaceous. Abdomen ovate, the posterior margins of the segments narrowly pale testaceous; the node of the peduncle thick but narrow, with its upper margin rounded.
Hab. Waigiou.

Gen. Polyrhachis, *Smith.*

1. Polyrhachis sexspinosus, *Latr. Hist. Nat. Fourm.* p. 126, pl. 4. f. 21 ☿.
Hab. Waigiou; Aru; Philippines; India; Mysol.

2. Polyrhachis Ithonus, *Smith, Proc. Linn. Soc.* v. 99. 10.
Hab. Waigiou; Bachian; Mysol.

3. Polyrhachis bihamatus, *Drury, Ins.* ii. pl. 38. f. 7, 8 ☿.
Hab. Waigiou; Celebes; Bachian; Ceram; Borneo; India.

4. Polyrhachis marginatus, *Smith, Proc. Linn. Soc.* iii. 139. 3.
Hab. Waigiou; Bachian; Philippines; India.

5. Polyrhachis Diaphantus, *Smith, Proc. Linn. Soc.* vi. 40. 14.
Hab. Ceram; Celebes.

6. Polyrhachis scutellatus, *Smith, Proc. Linn. Soc.* iii. 140. 7.
Hab. Ceram; Aru.

7. Polyrhachis rugifrons, *Proc. Linn. Soc.* v. 70. 3.
Hab. Ceram; Celebes.

8. Polyrhachis dives, *Smith, Proc. Linn. Soc.* ii. 64. 19.
Hab. Ceram; Malacca; Bachian.

9. Polyrhachis rufofemoratus, *Smith, Proc. Linn. Soc.* iii. 142. 14.
Hab. Ceram; Aru; Waigiou.

10. Polyrhachis Busiris, *Smith. Proc. Linn. Soc.* v. 98. 7.
Hab. Ceram; Bouru; Waigiou; Celebes; Bachian.

11. Polyrhachis sericatus, *Guér. Voy. Coq. Zool.* ii. 203; *Atlas Ins.* pl. 8. f. 2, 2 *a*, *b*, *c*, *d*, ☿.

Hab. Martabello; Waigiou; Aru; New Hebrides; Mysol.

12. Polyrhachis Valerus, *Smith, Proc. Linn. Soc.* vi. 40. 12.

Hab. Waigiou; Celebes (Tondano).

13. Polyrhachis serratus, *Smith, Proc. Linn. Soc.* iii. 140. 6.

Hab. Waigiou; Aru.

14. Polyrhachis Orsyllus, *Smith, Proc. Linn. Soc.* vi. 39. 8.

Hab. Ceram; Celebes (Tondano).

15. Polyrhachis sculpturatus, *Smith, Proc. Linn. Soc.* v. 70. 4.

Hab. Timor; Celebes.

16. Polyrhachis Acasta, *Smith, Proc. Linn. Soc.* v. 100. 14.

Hab. Bouru; Bachian.

17. Polyrhachis Dolomedes. *P.* niger, capite thoraceque subopacis; abdomine nitido; thorace inermi; pedibus ferrugineis; abdominis squamula spinis duabus acutis armata.

Female. Length $3\frac{1}{4}$ lines. Black, the front very prominent; the ridges under which the antennæ are inserted much elevated; the extreme base and apex of the scape, the apex of the five basal joints of the flagellum, and the following ones entirely ferruginous; the mandibles ferruginous. Thorax oblong-ovate; the metathorax truncate behind; the lateral angles of the verge of the truncation acute, or subdentate; the legs obscure ferruginous, their articulations pale. Abdomen globose, shining and slightly sericeous; the node of the peduncle armed above with two short, stout, acute spines.

Worker. Length $2\frac{1}{2}$ lines. Altogether more shining and smoother than the female; the front very prominent; the antennæ and legs pale ferruginous; the base of the abdomen obscurely ferruginous; the thorax compressed; the meso- and metathorax flattened above.

Hab. Ceram.

Mr. Wallace says, "Nest on a leaf, small, oval, and of papery texture."

18. Polyrhachis Trophimus. *P.* niger, capite thoraceque longitudinaliter striatis; metathorace petiolique squamula bispinosis; pedibus obscure ferrugineis.

Worker. Length 2 lines. Black; the head shining and finely striated longitudinally. Thorax flattened above and longitudinally striated, slightly shining; the suture between the meso- and metathorax strongly impressed; the metathorax with two slightly elevated acute spines, those on the peduncle are longer, stouter, and curve to the shape of the sides of the abdomen; the legs dark ferruginous. Abdomen globose, smooth, and shining.

Hab. Ceram.

19. Polyrhachis Alpheus. *P.* niger, capite thoraceque minute

verrucatis; thorace spinis duabus minutis antice armato; abdominis squamula supra bispinosa; pedibus ferrugineis.

Worker. Length 3 lines. Black; head and thorax minutely and finely rugose; the head very prominent in front; the mandibles and antennæ ferruginous, the scape more or less fuscous above. Thorax above and at the sides flat, the anterior angles with a short acute tooth; the legs ferruginous, the anterior coxæ black. The abdomen globular, smooth, and shining, with the base castaneous; the node of the peduncle armed with two long, acute, curved spines, which incline slightly towards the abdomen.

Hab. Waigiou.

20. Polyrhachis Bubastes. *P.* niger, capite rugoso; thorace spinis duabus acutis antice et postice armato; squama bispinosa; pedibus obscure ferrugineis.

Female. Length 5½ lines. Black, thinly sprinkled with erect hairs; the abdomen covered with ashy, silky pubescence; the legs dark ferruginous. The head very coarsely rugose, much narrowed behind the eyes, with the posterior lateral angles produced and forming curved flattened processes or spines. The thorax elongate, widest in the middle, rugose, but much more finely so than the head; the spines in front short, curved, stout, and acute; the posterior pair are of the same form; the legs obscurely ferruginous; the scale of the abdomen incrassate, rugose, and armed with two short acute spines behind.

Worker. This sex only differs in the form of the thorax, which is oblong, the sides straight and gradually narrowed slightly posteriorly; the sculpture on the thorax stronger than in the female.

Hab. Waigiou.

This species closely resembles the *P. sexspinosus*, but differs too much to be regarded as a variety of that species; the form of the head is very different, being more narrowed behind the eyes, the sides being straight; the short, thick, curved spines on the thorax also distinguish it from *P. sexpinosus*.

21. Polyrhachis paromalus. *P.* niger, lævis nitidusque, thorace spinis duabus acutis postice armato; pedibus obscure ferrugineis; squama spinis duabus acutis curvatis.

Worker. Length 3 lines. Jet-black, smooth and shining; the mandibles ferruginous; the extreme base and apex of the antennæ rufopiceous; the head much narrowed behind the eyes, which are round and prominent; the front of the head very convex. Thorax: on each side in front a minute tooth or tubercle; armed posteriorly with two long, bent, acute spines, directed backwards; the metathorax oblique; the legs long and obscurely ferruginous. Abdomen: the node of the pedunele with two long, bent, acute spines directed backwards above the base of the abdomen; the latter smooth, shining, and globose.

Hab. Ceram.

Mr. Wallace, in a note, says, "Nest on a tree, consisting of two small cells of soft papery matter, about one inch in diameter; each with one opening."

22. Polyrhachis Xiphias. *P.* niger, lævis nitidusque, metathorace petiolique squamula bispinosis.

Female. Length $4\frac{1}{4}$ lines. Black; the head subquadrate, the front very convex, smooth and shining; the flagellum pale ferruginous, with two or three of the basal joints fuscous above. Thorax ovate; the metathorax truncate, and armed with two short acute spines; the legs obscure ferruginous, with the articulations palest, the trochanters very pale; wings opake, the nervures rufo-testaceous, the stigma fuscous. Abdomen globose, smooth and shining; the peduncle with two short acute spines, directed backwards, and slightly curved.

Hab. Waigiou.

23. Polyrhachis Euryalus. *P.* niger, lævis, nitidus, thorace inermi; petioli squamula quadrispinosa.

Worker. Length $2\frac{1}{2}$ lines. Black, smooth and shining; the thorax rounded above, not spined; the outline, when viewed laterally, semicircular; the legs obscure ferruginous. Abdomen globose; the node of the peduncle with four spines, the two inner ones shorter than the lateral pair, but all short and acute.

Hab. Mysol.

24. Polyrhachis Dolomedes. *P.* niger, thorace supra deplanato; abdominis squama spinis duabus curvatis armata; abdomine nitido; pedibus obscure ferrugineis; flagello flavo-testacco.

Worker. Length 3 lines. Black; the head and thorax subopake; the abdomen smooth and shining; the flagellum testaceous yellow, or pale ferruginous; the legs dark ferruginous. The thorax flattened above, the anterior angle acute, or produced into short acute teeth; the metathorax unarmed; the front of the head very prominent. The abdomen globose; the node of the peduncle with two long acute spines, which are divergent and curve backwards to the shape of the base of the abdomen.

Hab. Waigiou.

This species may very probably prove to be the worker of *Polyrhachis Xiphias*.

25. Polyrhachis Sparaxes. *P.* niger, capite thoraceque subopacis; thorace inermi; abdominis squamula trispinosa; alis subhyalinis, nervuris pallide testaceis.

Female. Length 3 lines. Black; the head and thorax finely rugose and subopake; the abdomen globose and shining; the extreme apex of the flagellum pale rufo-testaceous; the angles of the prothorax acute; the wings yellow, with the nervures pale testaceous; the node of the peduncle with three acute spines, erect, and of equal length; the abdomen slightly sericeous.

Hab. Mysol.

This is very distinct from *P. trispinosus*, which is much larger and has the anterior angles of the thorax rounded; the spines on the node of the peduncle are shorter, and the central one shorter than the others.

26. Polyrhachis nigriceps. *P.* ferrugineus, nitidus, capite nigro; thorace spinis duabus acutis antice et postice armato.

Worker. Length 4 lines. Smooth, shining, and impunctate; the head oblong, the eyes prominent and placed backwards; the mandibles stout, obscurely ferruginous, and quadridentate at the apex; the ridges on the front, at the sides of which the antennæ are inserted, much elevated, and with a less elevated ridge between them; the antennæ ferruginous. Thorax elongate as in *P. sexspinosus*, with two acute teeth in front diverging outwards, and two suberect ones behind; the legs elongate, paler than the thorax. Abdomen paler than the head and thorax, the node of the pedunele incrassate, somewhat wedge-shaped above.

Hab. Waigiou.

27. Polyrhachis Paxillus. *P.* niger; thorace supra deplanato, metathorace et pedunculo spinis duabus longis acutis armatis; pedibus ferrugineis.

Worker. Length $3\frac{1}{2}$ lines. Black; the head and thorax finely shagreened; the mandibles ferruginous, but obscure, finely striated; the flagellum fusco-ferruginous; the extreme base of the scape bright ferruginous. Thorax oblong, narrowed behind, flattened above and at the sides, the lateral margins raised, particularly those of the prothorax in front; the metathorax has two long, slightly bent, acute spines directed backwards over the node of the peduncle, which has also two acute spines directed backwards; the legs ferruginous. Abdomen globose, smooth and shining, with a fine silky fulvous pile which changes colour in different lights.

Hab. Martabello.

Gen. Œcophylla, *Smith.*

1. Œcophylla smaragdina, *Smith, Proc. Linn. Soc.* v. 102. 1. (Formica smaragdina, *Fabr. Syst. Piez.* p. 397. 4.)

Hab. Mysol; Timor; Waigiou; Gilolo; Bachian; Dory; Aru; Borneo; Philippines; Java; India.

Fam. PONERIDÆ, *Smith.*

Gen. Ponera, *Latr.*

1. Ponera parallela, *Smith, Proc. Linn. Soc.* iii. 143. 3.

Hab. Waigiou; Aru; Celebes; Mysol.

2. Ponera læviceps, *Smith, Proc. Linn. Soc.* ii. 69. 13.

Hab. Waigiou; Celebes; Bachian; Borneo.

3. Ponera cuprea, *Smith, Proc. Linn. Soc.* v. 104. 6.

Hab. Ceram; Dory.

4. Ponera purpurea. *P.* purpureo-cærulea; capite, thorace abdominisque basi profunde striatis; abdominis nodo incrassato, supra spinis duabus parvis armato.

Worker. Length 4 lines. Purple-blue, the antennæ and legs fusco-ferruginous; the second and following segments of the abdomen black, with the margins of the segments rufo-piceous. The head evenly, strongly, and longitudinally striated; the striation on the prothorax is strong, transverse, and curved; that on the thorax behind is also transverse and runs obliquely forwards at the sides; the striæ on the peduncle run round it, being circular; on the first segment of the abdomen, in the centre of its apical margin, is a minute curved stria in the form of a horse-shoe, round which passes a second, and so on, each successive stria being an enlarged form of the preceding; the second and following segments with a silky texture.

Hab. Gilolo.

5. Ponera tortuolosa. *P.* æneo-nigra; capite, thorace abdominisque basi striatis; nodo spinis duabus acutis armato. (*Operaria.*)—*P.* nitida, nigra; capite longitudinaliter striato; thorace profunde punctato. (*Fœmina.*)

Worker. Length 5 lines. Obscurely nigro-æneous, covered with a short yellowish downy pile, and sprinkled with longer cinereous hair; the head strongly striated, the striæ radiating as it were from the middle of the face and running obliquely to the sides of the head; down the cheeks the striæ are longitudinal; the mandibles obscure rufo-piceous. Thorax: the striæ on the prothorax are transverse and curved, behind which they are oblique, running from the middle forwards down the sides; the peduncle is incrassate, rounded in front and truncate behind, the striæ running round, above armed with two acute spines. The first node of the abdomen has a curved striation much more delicate than that on the thorax; the following segments not striated, with their apical margins rufo-piceous; the legs dark fusco-ferruginous.

Female. The same size as the worker, shining, the head longitudinally striated, the thorax with large scattered punctures; the abdomen impunctate, with the margins of the segments rufo-piceous; wings slightly fuscous, the nervures black, with a dark fuscous cloud in the marginal cell; the tibiæ and tarsi ferruginous as well as the mandibles and antennæ.

Hab. Ceram; Bouru.

The sexes were identified by Mr. Wallace.

Gen. Amblyopone, *Erichs.*

1. Amblyopone castaneus, *Smith, Proc. Linn. Soc.* v. 105. 1.

Hab. Ceram; Bachian.

Gen. Ectatomma, *Smith.*

1. Ectatomma rugosa, *Smith, Proc. Linn. Soc.* iv. 143. 1.
Hab. Ceram; Aru.

Gen. Odontomachus, *Latr.*

1. Odontomachus simillimus, *Smith, Cat. Form.* p. 80. 11; *Proc. Linn. Soc.* iv. 144. 1.
Hab. Waigiou; Ceram; Aru; Ceylon; Goram.

2. Odontomachus tyrannicus, *Smith, Proc. Linn. Soc.* vi. 44. 3.
Hab. Waigiou; Aru; Mysol; Celebes.

3. Odontomachus malignus, *Smith, Proc. Linn. Soc.* iii. 144. 3.
Hab. Ceram; Aru; Mysol.

4. Odontomachus nigriceps, *Smith, Proc. Linn. Soc.* v. 103. 3.
Hab. Mysol; New Guinea (Dory).

5. Odontomachus cephalotes. *O.* ferrugineus, capite abdomineque longitudinaliter striatis; thoracc oblongo, transversim striato.
Worker. Length 5¼ lines. Ferruginous; the head and abdomen, or sometimes the entire insect, more or less fuscous, the antennæ and legs pale ferruginous; the mandibles tridentate at the apex, the inner and outer teeth, particularly the former, blunt at their apex; their inner margin without teeth; the head large, oblong-quadrate, finely striated longitudinally, and having a glossy silky appearance. The thorax and node of the abdomen finely striated transversely. The abdomen striated transversely at the base, the striæ curving at the sides and then running in a longitudinal direction to the apex.
Hab. Ceram.

6. Odontomachus aciculatus. *O.* fusco-ferrugineus; capite supra longitudinaliter striato, thoracc abdomineque transversim striatis.
Worker. Length 5½ lines. Blackish brown, with the antennæ, legs, and mandibles ferruginous; the head posteriorly and the node of the pedunele reddish brown; the mandibles tridentate at the apex, their inner margin serrated. The face longitudinally striated; the sides of the head behind the eyes obliquely striated, the striation much finer than that on the face. Thorax: the prothorax with a circular striation, behind which it is transverse. The node of the pedunele transversely striated, terminating above in one acute spine; the abdomen transversely and finely aciculate.
Hab. Mysol.

Gen. Podomyrma, *Smith.*

1. Podomyrma basalis, *Smith, Proc. Linn. Soc.* iii. 147. 4.
Hab. Mysol; Bouru; Amboyna; Aru; Dory.
The specimens from Mysol consist of a worker and a female: the latter

differs from the former in having the thorax oblong-ovate, with a few striæ down the middle, leaving the sides smooth; the striæ do not extend beyond the scutellum, the metathorax being smooth and shining; the first node of the peduncle is oblong, slightly curving downwards, and not toothed either above or beneath; the second node is globose and longitudinally striated. Abdomen oblong-ovate, pale ferruginous or rather clay-coloured; the apical margin of the first segment with a broad black band, which is toothed in the middle; the second segment has a narrower band.

2. Podomyrma lævissima. *P.* nigro-ferruginea; thorace abdomineque lævissimis lucidisque; capite delicatule punctato; femoribus medio valde incrassatis, basi tenuissimis.

Worker. Length $2\frac{3}{4}$ lines. Dark castaneous, nearly black, with the mandibles, abdomen at the base, and the legs in parts obscure ferruginous, the mandibles palest; the head oblong-quadrate, with the angles rounded, delicately striated between the antennæ, and very finely punctured behind their insertion. Thorax deeply strangulated in the middle, the anterior angles produced and acute.

Hab. Mysol.

3. Podomyrma ruficeps. *P.* fusco-ferruginea; capite rubro; capite thoraceque longitudinaliter striatim rugulosis; femoribus medio valde incrassatis, basi tenuissimis; pedibus abdomineque lævissimis lucidisque.

Worker. Length 4 lines. Head ferruginous, the antennæ and teeth of the mandibles black; the thorax, abdomen, and legs dark fusco-ferruginous; the head, thorax, and nodes of the petiole coarsely and longitudinally rugose, on the disk of the thorax running into irregular coarse striæ; on each side of the thorax in front is a stout blunt spine; the metathorax has two short teeth or spines, and the first node of the abdomen has a tooth in the middle above, and another at the base beneath. The abdomen is oblong-ovate, and pointed at the apex; the legs smooth and shining, with the femora much swollen in the middle; the antennæ, thorax, abdomen, and legs thinly sprinkled with erect pale hairs.

Hab. Mysol.

Gen. Pseudomyrma, *Guér.*

1. Pseudomyrma læviceps, *Smith, Proc. Linn. Soc.* iii. 145. 1.

Hab. Ceram; Dory; Aru; Waigiou.

2. Pseudomyrma carbonaria. *P.* aterrima, lævis, nitida; antennis, mandibulis, tibiis tarsisque rufo-testaceis.

Worker. Length 2 lines. Jet-black, smooth and shining; the eyes large, oblong-ovate, occupying a considerable portion of the sides of the head; the antennæ and mandibles rufo-testaceous. Thorax oblong, widest in front, the divisions strongly impressed; the tibiæ and

tarsi rufo-testaceous. Abdomen oblong-ovate, the petiole of the first node short; the second node wider than the first, subglobose.

Female. Resembles the worker, but with the head longer, the sides more parallel, and having three ocelli on the vertex; the legs are rather darker; in other respects both sexes are alike.

Hab. Bouru.

Gen. Myrmica, *Latr.*

1. Myrmica poneroides, *Smith, Proc. Linn. Soc.* v. 107. 2.

Hab. Ceram; Bouru; Bachian.

2. Myrmica incerta. *M.* nigra, capite ferrugineo; capite thoraceque longitudinaliter striatis; metathorace bispinoso.

Female. Length $2\frac{3}{4}$ lines. Head ferruginous; the thorax and abdomen black, the former obscurely ferruginous on the disk; the legs rufo-fuscous, with the anterior tibiæ and all the tarsi palest; the flagellum pale ferruginous. The head heart-shaped, and, as well as the thorax, longitudinally striated; the thorax short and rounded, posteriorly armed with two short acute spines. Abdomen rounded, truncate at the base, and covered with a fine silky pubescence; the first node of the abdomen small and compressed, the second transverse and more than twice the width of the first.

Hab. Mysol.

This species is probably not a true Myrmica; it has exactly the appearance of a small Œcodoma; it may be a female of *Crematogaster*.

3. Myrmica mœsta. *M.* fusco-nigra, nitida; mandibulis, antennis pedibusque rufo-ferrugineis; metathorace mutico.

Worker. Length 2 lines. Blackish brown, shining; the anterior margin of the head, the mandibles and antennæ rufo-ferruginous; the head finely striated longitudinally. Thorax delicately striated and with scattered punctures; the legs rufo-ferruginous. Abdomen smooth and shining, the nodes globose.

Hab. Martabello.

4. Myrmica umbripennis. *M.* rufo-ferruginea, nitida; capite thoraceque sparse punctatis, alis nigro-fuscis.

Female. Length $2\frac{1}{2}$ lines. Bright rufo-ferruginous, smooth and shining; the head with a few fine, distant punctures. Thorax short, ovate, and with a few strong, distant punctures; the wings dark brown; the metathorax subdentate. Abdomen ovate, the nodes of the peduncle subovate, smooth and shining.

Hab. Mysol.

Fam. ATTIDÆ, *Smith.*

Gen. Solenopsis, *Westw.*

1. Solenopsis cephalotes, *Smith, Proc. Linn. Soc.* v. 113. 1.

Hab. Ceram; Aru; Celebes.

2. Solenopsis laboriosa, *Smith, Proc. Linn. Soc.* vi. 48. 2.
Hab. Waigiou; Celebes (Tondano).

3. Solenopsis calida. *S.* fusco-ferruginea; capite oblongo-ovato, longitudinaliter striato, postice transverse striato; abdomine oblongo, nitido; pedibus ferrugineis.
Female. Length 7 lines. Dark brown, with the anterior margin of the face and the antennæ ferruginous; the head longitudinally striated before the ocelli, behind which it has a curved rugose striation; the mandibles obscure ferruginous, smooth, with a few oblong punctures at their inner margin, and having two teeth at their apex. Thorax ovate, shining, with five distant punctures; the sutures ferruginous, as well as the apex of the metathorax; the legs bright pale ferruginous; the lateral angles of the superior surface of the metathorax subdentate. Abdomen oblong-ovate, the apical margins of the segments broadly obscure ferruginous; the nodes of the abdomen thickened, transverse, rounded above.
Hab. Ceram.

Gen. Pheidole, *Westw.*

1. Pheidole megacephala, *Smith, Proc. Linn. Soc.* v. 112. 5.
Hab. Timor; Tondano; Bachian.

2. Pheidole singularis. *P.* rufo-ferruginea; capite maximo, striato et punctato, postice emarginato; thorace quadrispinoso.
Worker. Length 2 lines. Rufo-ferruginous; the head very large, more than four times the size of the abdomen, longitudinally striated, with the sides and posterior portion strongly punctured, the posterior margin deeply emarginate; a curved transverse depression crossing from eye to eye, the curve being backwards; the mandibles very stout, smooth, and without teeth on their inner margin. Thorax armed in front with a stout acute spine on each side; the metathorax has also two spines, which are much smaller, nearly upright, and acute. Abdomen small, ovate, and fuscous towards the apex.
Hab. Mysol.

3. Pheidole mordax. *P.* rufo-ferruginea; capite maximo, longitudinaliter striato; metathoracis spinis acutis, minutissimis; abdomine apice fusco.
Worker. Length 2 lines. Rufo-ferruginous; the head very large, at least four times the size of the abdomen, longitudinally striated, deeply emarginate behind. The thorax smooth and shining in front, and with two minute, erect, acute spines on the metathorax; the legs long, slender, and paler than the body. Abdomen small and ovate, ferruginous at the base and fuscous at the apex; the first node of the peduncle small and compressed, the second subglobose and transverse.
Hab. Mysol.

4. Pheidole penetralis. *P.* rufo-ferruginea; capite maximo, in medio sulcato et longitudinaliter striato; metathorace bispinoso; abdomine apice fusco.

Worker. Length 2 lines. Rufo-ferruginous; the head very large, longitudinally deeply striated, the striæ scarcely extending to the posterior margin, which is roughened and deeply emarginate in the middle; the mandibles incrassate, smooth and shining. Thorax very narrow, strangulated in the middle, smooth and shining anteriorly, and armed with two small acute spines on the metathorax; the abdomen fuscous, with the base ferruginous.

Hab. Mysol.

Subfam. Cryptoceridæ, *Smith.*

Gen. Echinopla, *Smith.*

1. Echinopla striata, *Smith, Proc. Linn. Soc.* ii. 80. 3.

Hab. Ceram; Celebes; Malacca.

2. Echinopla nitida. *E.* nigra; capite, thorace et abdomine lævibus, nitidis; pedunculo transverso; antennarum pedumque apicibus ferrugineis.

Worker. Length 2 lines. Jet-black, smooth and shining; the apex of the antennæ rufo-testaceous; the head rounded in front and transverse behind; eyes round and very prominent. The thorax oblong-quadrate, scarcely as wide as the head, rather widest behind; the apical joints of the tarsi ferruginous. Abdomen subglobose; the node of the peduncle transverse, each lateral extremity armed with three teeth, two of which are at the upper margin of the extremity, the third and the largest being at the lower margin.

Hab. Ceram.

3. Echinopla deceptor. *E.* nigra, capite thoraceque longitudinaliter striatis; abdomine nigro-cæruleo, squama in utroque latere spina horizontali; tarsis apicalibus pallide testaceis.

Female. Length 4 lines. Black, with the abdomen obscurely blue. The head a little wider than the thorax and longitudinally striated. Thorax oblong, longitudinally striated, the sides parallel to the base of the scutellum, then obliquely narrowed to the base of the metathorax, the sides of which are rounded and expanded beyond the width of the prothorax; the metathorax is also rounded behind; the claw-joint of the tarsi testaceous; the legs and also the body thinly sprinkled with pale hairs; wings wanting. Abdomen globose and pubescent, the scale of the peduncle transverse, its superior margin slightly curved, and with a number of minute denticulations, terminating on each side in an acute point or spine.

Hab. Bouru.

Gen. Cataulacus, *Smith*.

1. Cataulacus setosus, *Smith, Proc. Linn. Soc.* v. 114. 1.
Hab. Mysol; Waigiou; Bachian.

The specimen from Mysol is a female: this sex differs in having a single ocellus on the vertex; it is very minute, and situated in a pit; the head is rather smaller, and the eyes also are smaller; the thorax is only subdentate behind; the abdomen is oblong-ovate, and emarginate at the base.

Fam. MUTILLIDÆ, *Leach*.

Gen. Mutilla, *Linn*.

1. Mutilla Ianthea, *Smith, Proc. Linn. Soc.* v. 115. 3.
Hab. Ceram; Amboyna; Bachian.

2. Mutilla anthylla, *Smith, Proc. Linn. Soc.* v. 115. 4.
Hab. Ceram; Gilolo; Bachian.

3. Mutilla nigra, *Smith, Proc. Linn. Soc.* iii. 151. 4.
Hab. Ceram; Aru.

4. Mutilla suspiciosa, *Smith, Proc. Linn. Soc.* ii. 84. 5.
Hab. Bouru; Makassar; Amboyna; Bachian; Borneo.

5. Mutilla mirabilis. *M.* cupreo-viridi tincta; scapo pedibusque ferrugineis; alis fuscis, basi hyalinis.

Male. Length 5 lines. Entirely bright copper-coloured, with tints of green in different lights; the head and thorax strongly punctured, the abdomen more finely and distantly so; the mandibles, palpi, scape, two basal joints of the flagellum, and the legs ferruginous, the rest of the antennæ black; the head, thorax, legs, and two basal segments of the abdomen thinly covered with erect, long, pale pubescence, that on the rest of the abdomen black; the wings brown, with their base subhyaline.

Hab. Waigiou.

6. Mutilla Damia. *M.* capite abdomineque nigris; thorace rubro; alis fuscis, basi hyalinis; abdomine fascia albo-pubescente decorato.

Male. Length 3½–4 lines. Head, abdomen, legs, and antennæ black; thorax red, thinly sprinkled with long pale hair; the apical margin of the second segment of the abdomen with a fascia of long snow-white hair; the margin of the basal segment is also thinly fringed with the same. The head and thorax strongly punctured; the abdomen with more distant strong punctures; the pubescence on the third, fourth, fifth, and sixth segments black, that on the apical one white; the wings fuscous, with their base subhyaline.

Hab. Ceram.

7. Mutilla Thera. *M.* capite abdomineque nigris; thorace rubro; abdominis segmento secundo fascia albo-pubescente ornato.

Female. Length 4 lines. Head, antennæ, legs, and abdomen black, finely shagreened and subopake; thinly sprinkled with black hairs; the legs sprinkled with glittering white hairs. The thorax red, rugose, and clothed with decumbent red hair; its anterior and posterior margins transverse; the sides rounded, but slightly narrowed behind. The apical margin of the second segment of the abdomen with a narrow band of white pubescence, produced and widened in the middle of the band; the fifth segment fringed with glittering pale pubescence; the sixth longitudinally striated, with the base ferruginous.

Hab. Ceram.

8. Mutilla fausta. *M.* capite thoraceque nigro-cæruleis; abdomine nigro, fascia argenteo-pubescente decorato.

Female. Length $2\frac{3}{4}$ lines. Head and thorax blue-black, and closely punctured; the palpi elongate and pale rufo-testaceous; the mandibles, apex of the scape, the tibiæ and tarsi ferruginous; the tibiæ dusky outside; the head wider than the thorax, and transverse-quadrate above. The basal segment of the abdomen yellowish above; the second segment with its apical margin pale testaceous and clothed with silvery-white hair, the band produced in the middle into a bilobed shape; the apical segment rufo-testaceous, smooth and shining; the insect thinly sprinkled with erect pale pubescence.

Hab. Mysol.

Gen. Tiphia, *Fabr.*

1. Tiphia intrudens. *T.* nitida, atra, punctata, sparse griseo-pubescens; femoribus quatuor posticis compressis; linea intermedia metathoracis ad lineam transversam excurrente.

Female. Length $3\frac{1}{2}$–5 lines. Black and shining; the head with strong but rather distant punctures; the mandibles ferruginous. Thorax: the pro- and mesothorax strongly punctured, the posterior margin of the former smooth and shining; the metathorax smooth, the superior surface with three elevated longitudinal lines, all extending to the verge of the truncation,—the lines nearly parallel, very slightly converging towards the apex; the anterior wings fusco-hyaline; the tegulæ smooth and shining, with their posterior margins rufo-piceous; the tips of the femora rufo-piceous. Abdomen delicately punctured; the apical segment rugose, with the tip ferruginous; the legs, the sides and apex of the abdomen with glittering pale hairs.

The *male* differs in having the marginal cell closed and the stigma large and black.

Hab. Mysol.

Fam. THYNNIDÆ, *Erichs.*

Gen. Thynnus, *Fabr.*

1. Thynnus lugubris. *T.* niger, delicatule punctulatus; alis fusco-nigris.

Male. Length 9 lines. Black, closely and finely punctured; the clypeus with its anterior margin truncate; longitudinally and irregularly striated, the striæ interspersed with strong punctures; the orbits of the eyes narrowly bordered with yellow, the border interrupted above. The disk of the thorax more strongly punctured than the other portion; the anterior margin of the prothorax fringed with dark pubescence; the wings dark fuscous, palest at their apical margins. Abdomen shining, more delicately and more distantly punctured than the head and thorax; the apical segment longitudinally striated above; the sixth segment has a short acute spine on each side beneath; the seventh is terminated by a tridentate mucro, and has also on each side a small, flattened, projecting process; the abdomen is much more strongly punctured beneath than above.

Hab. Ceram.

2. Thynnus insularis. *T.* ferrugineus, capite thoraceque rude punctatis.

Female. Length 3 lines. Ferruginous; the head quadrate, strongly punctured, more or less fuscous, the eyes situated at the anterior angles; the antennæ and mandibles pale ferruginous. Thorax coarsely punctured, the metathorax obliquely rounded; the legs spinose. Abdomen oblong, strongly punctured, the segments darkest at the base; the body thinly sprinkled with pale, erect pubescence.

Hab. Mysol.

3. Thynnus placidus. *T.* niger, nitidus, punctulatus; abdomine lævi, delicatule et sparse punctulato; alis anticis fusco-nigris, purpureo-iridescentibus, posticis subhyalinis.

Male. Length $8\frac{1}{2}$ lines. Black and shining; the head and thorax finely and closely punctured, the abdomen delicately and distantly so. The anterior margin of the clypeus truncate; the outer orbits of the eyes narrowly bordered with yellow; there is also an abbreviated line on their inner orbits. The wings with a slight purple iridescence; the anterior pair dark fuscous, with their apical margins paler; the posterior pair subhyaline. Abdomen shining black, with a fine chalybeous iridescence, delicately and not very closely punctured, beneath strongly punctured.

Hab. Waigiou.

4. Thynnus pullatus. *T.* niger, nitidus, capite thoraceque punctatis, alis fusco-hyalinis. (*Mas.*)—*T.* niger, thorace antice coarcte punctato, abdomine utrinque maculis tribus flavis. (*Fœm.*)

Male. Length 9 lines. Black, the head and thorax closely punctured, slightly shining; a narrow abbreviated line on the inner orbits of the eyes and a similar line behind them yellow; a minute yellow spot at the base of the mandibles; the pubescence on the head, on the sides of the thorax and beneath, cinereous; the wings subhyaline, tinged

with brown. Abdomen conical, gradually tapering from the base to the apex, smooth, shining, and delicately punctured.

Female. Length 6½ lines. Black, pubescent; the mandibles in the middle and the scape of the antennæ at the apex ferruginous; the vertex with a deep depression on each side above, with a raised central carina between them. The thorax above closely and deeply punctured; the metathorax smooth and obliquely truncate; the legs obscurely ferruginous, and thickly set with rigid hairs and spines of a pale testaceous colour. Abdomen: the first segment thickly fringed with pale pubescence at the base; the second transversely striated, the following segments smooth and shining; the first and second segments with a small yellow spot on each side; the third segment has a transverse yellow stripe; beneath, the segments are punctured, except the apical one, which is longitudinally striated.

Hab. Bouru.

Gen. Ælurus, *Klug.*

1. Ælurus comatus. *Æ.* niger, capite thoraceque rude punctatis; abdomine lævi, nitido; capitis margine postico pube cinerea vestito; alis hyalinis.

Male. Length 5 lines. Black; the head and thorax closely and strongly punctured, and thinly sprinkled with cinereous pubescence; head transverse, rather wider than the thorax, the posterior margin with a long fringe of cinereous pubescence; the face before the insertion of the antennæ with a silvery-white pubescence. The wings hyaline and iridescent, the nervures fuscous. The abdomen petiolated, smooth and shining, terminating in a trifid mucro.

Hab. Waigiou.

This is the first species that has been captured away from the Australian continent, with the exception of two species from Brazil.

Gen. Scleroderma, *Latr.*

1. Scleroderma modesta. *S.* capite, thorace pedibusque pallide testaceis; abdomine rufo-piceo cingulato.

Female. Length 2 lines. The head, antennæ, thorax, and legs pale honey-yellow; the tips of the mandibles ferruginous; the sutures of the thorax and the articulations of the legs with ferruginous stains; the exterior margin of the intermediate tibiæ serrated. The basal margins of the segments of the abdomen broadly rufo-piceous; the abdomen elongate and lanceolate.

Hab. Mysol.

Gen. Scolia, *Fabr.*

Div. 1. *Two submarginal cells and one recurrent nervure.*

1. Scolia insularis, *Smith, Proc. Linn. Soc.* iv. 153. 4.

Hab. Ceram; Bouru; Key Island.

2. Scolia fulgidipennis, *Smith, Proc. Linn. Soc.* iv. 152. 3.
Hab. Waigiou; Aru; Bachian; Martabello.

3. Scolia nitida, *Smith, Proc. Linn. Soc.* iv. 152. 2.
Hab. Waigiou; Bouru; Timor; Aru; Amboyna; Dory; Martabello.

4. Scolia captiva, *Smith, Proc. Linn. Soc.* vi. 22. 1.
Hab. Waigiou; Gilolo; Martabello.

5. Scolia dubia. *S.* nigra, nitida, punctatissima; alis fuscis, violaceo-micantibus; abdomine cæruleo-iridescente.
Male. Length $7\frac{1}{2}$ lines. Black and shining; the head and thorax closely and strongly punctured; the mandibles obscurely rufo-piceous; the wings dark brown, with a bright violet iridescence, changeable in different lights, occasionally showing tints of blue; the metathorax roughly punctured; the legs thickly set with rigid black hairs. The abdomen glossy, more finely punctured than the head and thorax, the basal segment most strongly so; adorned with a beautiful blue iridescence, in some lights reflecting faint tints of violet; the apical segment triangular, punctured, with its posterior margin narrowly pale testaceous.
Hab. Ceram.

6. Scolia larradiformis. *S.* nigra, nitida, sparse punctata; abdomine alisque violaceo-micantibus.
Female. Length $5\frac{1}{2}$ lines. Black, smooth and shining, finely and sparingly punctured, particularly on the head and thorax above; the metathorax truncate, and having a few strong punctures at the verge of the truncation, the latter smooth and opake; the head as wide as the thorax and subquadrate, with the angles rounded, convex in front; the ocelli minute; the wings dark brown, with a beautiful violet iridescence; the legs pubescent, with the spurs on the tibiæ simple. Abdomen subpetiolate, shining, with a slight blue and violet iridescence; the basal segment with a few strongish punctures, the apical segment roughly punctured.
Hab. Waigiou.

7. Scolia morata. *S.* nigra, hirta, punctata; thoracis dorso lævi; alis nigro-violaceis, abdomine nigro-chalybæo.
Male. Length $4\frac{1}{2}$–$5\frac{1}{2}$ lines. Black, and thinly covered with black pubescence; the head and thorax above very finely and sparingly punctured; wings obscure brown, with a beautiful violet iridescence, tinged in some lights with coppery lustre; the third discoidal cell small, its apical recurrent nervure uniting with the basal one as in *S. dimidiata*. The abdomen smooth, shining, and finely punctured, with a beautiful chalybeous iridescence.
Hab. Mysol.

Div. 2. *The anterior wings with two submarginal cells and two recurrent nervures.*

8. Scolia aurulenta, *Smith, Cat. Hym. Ins.* pt. 3. 102. 80.
Hab. Mysol; Bouru; Bachian; Silhet; Celebes; Philippine Islands.

9. Scolia aureicollis, *St. Farg. Hym.* iii. 499. 6.
Hab. Mysol; Ternate; Bachian; Philippines; Celebes; Silhet.

10. Scolia fimbriata, *Burm. Abh. Nat. Ges. Halle*, i. 25. 6.
Hab. Waigiou; Java.

11. Scolia agilis, *Smith, Proc. Linn. Soc.* iv. 10. 6.
Hab. Waigiou; Celebes.

Div. 3. *The anterior wings with three submarginal cells and two recurrent nervures.*

12. Scolia dimidiata, *Guér. Voy. Coq. Zool.* ii. pt. 2. 247.
Hab. Ceram; Bouru; Gilolo; Celebes; Bachian; Amboyna; Senegal.

Fam. POMPILIDÆ, *Leach.*

Gen. Pompilus, *Fabr.*

1. Pompilus bicolor, *Fabr. Syst. Piez.* p. 198. 56.
Hab. Ceram; Australia.

The single example from Ceram is a male; it differs from the Australian specimens in having not only the apical half of the second segment of the abdomen black, but the third and fourth segments also; in other respects they are identical.

2. Pompilus depredator, *Smith, Proc. Linn. Soc.* v. 119. 3.
Hab. Bachian.

3. Pompilus jucundus. *P.* ater, capite thoraceque pube cinerea tectis; alis hyalinis, fasciis duabus fuscis; prothoracis margine postico flavo.

Female. Length $5\frac{1}{2}$ lines. Black; the head and thorax with a thin cinereous pile; the scape yellow in front; the flagellum fulvous beneath; the anterior margin of the clypeus and tips of the mandibles rufo-piceous; the palpi pale testaceous. The posterior margin of the prothorax yellow; the wings hyaline, the anterior pair with a narrow fuscous fascia crossing the base of the first and second discoidal cells, and a second fascia as wide as the second and third submarginal cells; the tips of the wings milky white; the extreme apex of the coxæ yellow; the tips of the femora, the tibiæ and tarsi ferruginous beneath. Abdomen shining, its apex rufo-piceous.

Hab. Mysol.

4. Pompilus vigilans. *P.* ater, guttis maculisque variegatus; alis hyalinis, apice fuscis; tibiis posticis basi flavis.

Female. Length 5 lines. Black; the orbits of the eyes, interrupted above, and the anterior margin of the clypeus yellow, the yellow

margin of the clypeus notched in the middle; the mandibles ferruginous, their base black. The posterior margin of the prothorax yellow; the wings hyaline, with their apex fuscous; the posterior tibiæ yellow at their base above, and entirely ferruginous beneath. Abdomen shining, with an obscure chalybeous reflexion; the basal margin of the third and fifth segments with a narrow yellow band.

Male. Closely resembles the female, but wants the yellow margin to the clypeus; the mandibles are yellow.

Hab. Waigiou.

Gen. Priocnemis, *Schiödte.*

1. Priocnemis pulcherrimus, *Smith, Proc. Linn. Soc.* iii. 156. 1.

Hab. Mysol; Aru.

2. Priocnemis flavipennis, *Smith, Proc. Linn. Soc.* iv. 79. 1.

Hab. Ceram; Celebes (Makassar).

3. Priocnemis fervidus, *Smith, Proc. Linn. Soc.* iii. 156. 2.

Hab. Mysol; Dory; Ceram; Aru.

4. Priocnemis adustus. *P.* ferrugineus; alis flavo-hyalinis, fusco fasciatis.

Male. Length 6½ lines. Ferruginous; the head and antennæ paler than the body; the thorax and head opake; the clypeus smooth and shining, with its anterior margin transverse and entire. The thorax has a fine, thin, short, downy pubescence; the metathorax slightly striated transversely at the apex; the wings yellow hyaline, with a broad fuscous fascia crossing near the apex of the anterior wings; the legs elongate, paler than the thorax. Abdomen shining, of a somewhat clavate form, and thinly covered with downy pubescence.

Hab. Mysol.

Gen. Agenia, *Schiödte.*

1. Agenia blanda, *Guér. Voy. Coq. Zool.* pt. 2. ii. 260.

Hab. Ceram; Celebes; Key Island; Borneo; India; Singapore; Malacca.

2. Agenia Amalthea, *Smith, Proc. Linn. Soc.* iii. 155. 6.

Hab. Waigiou; Aru.

3. Agenia Eudora. *A.* capite, metathorace abdomineque nigris; thorace pedibusque sanguineis; alis anticis fascia transversa fusca.

Female. Length 4½ lines. Head black; the clypeus, palpi, mandibles, and antennæ ferruginous. Thorax black, with the pro- and mesothorax blood-red above; the metathorax rounded behind, transversely striated, and covered with silvery pubescence; the legs pale red, with the claw-joints of the tarsi fuscous; the spurs at the apex of the tibiæ fuscous; the wings hyaline, the nervures ferruginous; the anterior pair with a broad fuscous fascia beyond the stigma; the tips of the wings milk-white. Abdomen petiolated, black, and thinly covered

with fine, pale, downy pile; the apical margin of the two basal segments narrowly rufo-piceous; the apex rufo-testaceous.

Hab. Mysol.

4. Agenia Numeria. *A.* nigra, pilis sericeis cinereis vestita; antennis subtus ferrugineis; abdomine petiolato; alis hyalinis, bifasciatis.

Female. Length 4 lines. Black, and thinly covered with a silky ashy-grey pile; the palpi pale ferruginous; the mandibles rufo-testaceous at their apex; the flagellum of the antennæ ferruginous beneath. The posterior margin of the prothorax rounded; the metathorax rounded posteriorly, opake, and finely and transversely rugose; the wings hyaline, with a narrow fuscous fascia at the apex of the externo-medial cell, and a much broader one crossing and enclosing the second and third submarginal cells; the tips of the wings fuscous.

Hab. Mysol.

5. Agenia Metella. *A.* nigra, pilis sericeis argentato-albis vestita; antennis antice pedibusque antice ferrugineis; abdomine petiolato; alis hyalinis, nervuris nigris.

Female. Length $4\frac{3}{4}$ lines. Black, and thinly covered with a silvery-white silky pile, which is most dense on the clypeus and metathorax; the antennæ ferruginous beneath, more or less fuscous above, particularly at their base; the palpi fusco-ferruginous; the mandibles rufo-piceous at their apex. The posterior margin of the prothorax rounded; the metathorax transversely rugose; the tibiæ and femora at their apex ferruginous in front; the tarsi ferruginous, the apical joints more or less fuscous above; the wings hyaline, the nervures black. Abdomen petiolated; the apical margins of the segments narrowly rufo-piceous.

Hab. Mysol.

6. Agenia Vesta. *A.* nigra, capite thoraceque pilis sericeis argentato-albis vestitis; abdomine nitido, subpetiolato; alis hyalinis, plaga fusca.

Female. Length $4\frac{1}{2}$ lines. Black; the flagellum obscurely fulvous towards the apex beneath; the head thinly covered with silvery silky pile, the face much more densely so. Thorax: the sides and the metathorax entirely covered with a dense silvery-white pubescent pile, the latter is less densely covered on the disk; the legs rufo-piceous beneath; wings hyaline, with a fuscous cloud occupying the marginal and two submarginal cells and the third discoidal cell; it also crosses the apex of the first and second discoidal cells. Abdomen smooth, shining black, and with a short petiole at its base; the apex rufo-piceous.

Hab. Mysol.

7. Agenia clavata. *A.* atra, capite thoraceque subopacis; abdomine clavato alis hyalinis, plaga minuta fusca.

Male. Length 6 lines. Black; the head and thorax subopake; the face covered with silvery-white pubescence; the tips of the mandibles ferruginous. Thorax oblong-quadrate, the sides being parallel; the metathorax transversely striated; the wings hyaline, with a small brown macula near the base of the marginal cell extending into the second submarginal cell, faint, and not well defined. The abdomen clavate; the first segment forming a petiole, with its apex slightly dilated.
Hab. Waigiou.

Gen. Mygnimia, *Smith*.

1. Mygnimia Aspasia, *Smith, Proc. Linn. Soc.* iv. 157. 1.
Hab. Martabello; Aru.

2. Mygnimia fervida, *Smith, Proc. Linn. Soc.* v. 82. 1.
Hab. Mysol; Bouru; Celebes.

3. Mygnimia iridipennis, *Smith, Proc. Linn. Soc.* iv. 13. 1.
Hab. Timor; Celebes; Borneo.

4. Mygnimia intrepida. *M.* nigra, capite thoraceque pube nigra vestitis; alis cæruleo violaceoque splendide micantibus.
Female. Length 13 lines. Black; the abdomen with obscure shades of blue in certain lights; the anterior margin of the clypeus widely emarginate; the pubescence on the head and thorax black; the metathorax with transverse ridges behind; wings black, with a splendid purple and violet iridescence, with tints of green in certain lights.
Hab. Timor.

5. Mygnimia opulenta. *M.* ferruginea, abdomine læte fusco; alis flavo-hyalinis, apice fuscis.
Male. Length 9½ lines. Ferruginous; the anterior margin of the clypeus transverse; the flagellum slightly fuscous above. The posterior margin of the prothorax rounded; the mesothorax above with a longitudinal fuscous stripe on each side, and a spot in front in the middle; the metathorax transversely striated; the legs elongate, and the tibiæ and tarsi with scattered, short, fine spines; the wings yellowish, their apical margins bordered by a fuscous cloud. The abdomen fusco-ferruginous.
Hab. Mysol.

6. Mygnimia exasperata. *M.* ferruginea, abdominis segmento secundo et tertio nigris; alis obscure fuscis, purpureo-iridescentibus.
Female. Length 9–10 lines. Ferruginous; the head and thorax opake; the antennæ thick and convolute; the clypeus slightly emarginate anteriorly. The posterior margin of the prothorax curved; the mesothorax with two black spots anteriorly; the metathorax rounded behind and transversely striated; the tibiæ and tarsi strongly spinose; the wings fuscous, with a purple iridescence. Abdomen smooth and

shining, with the second and third segments and the posterior margin of the basal segment black; entirely ferruginous beneath.

Hab. Mysol.

7. Mygnimia intrepida. *M.* capite thoraceque nigris, abdomine nigro-cæruleo; alis flavo-hyalinis, marginibus fuscis.

Female. Length 11–13 lines. Head and thorax opake black, with a thin black pubescence; the clypeus very convex, its anterior margin rounded. The scutellum and postscutellum prominent, produced into rounded tubercles; the metathorax villose, not punctured or striated; the wings yellow hyaline, the base, the apical and posterior margins with a narrow dark fuscous border; the legs elongate, the tibiæ and tarsi furnished with short spines, most dense on the latter, particularly the anterior pair. Abdomen black, with an obscure blue tinge, covered with a short silky pubescence.

Hab. Ceram.

Gen. Macromeris, *St. Farg.*

1. Macromeris violacea, *St. Farg., Guér. Mag. Zool.* pl. 30. fig. 1 ♂.

Hab. Ceram; Bouru; Gilolo; Celebes; Aru; Borneo; Java; Malacca; Assam; New Guinea.

Gen. Salius, *Fabr.*

1. Salius malignus, *Smith, Proc. Linn. Soc.* iii. 157. 1.

Hab. Mysol; Aru.

Fam. SPHEGIDÆ, *Leach.*

Gen. Sphex, *Fabr.*

1. Sphex tyrannica, *Smith, Proc. Linn. Soc.* v. 122. 5.

Hab. Mysol; Gilolo; Menado; Bachian; Kaisaa.

2. Sphex diabolicus, *Smith, Proc. Linn. Soc.* ii. 100.

Hab. Ceram; Amboyna; Bachian; Borneo.

3. Sphex argentata, *Dahlb. Hym. Europ.* i. 25. 1.

Hab. Ceram; Waigiou; Gilolo; Celebes; Aru; Bachian; Java; Bengal; Congo; Sierra Leone.

4. Sphex formosa, *Smith, Cat. Hym. Ins.* pt. iv. 254. 60.

Hab. Ceram; Waigiou; Bachian; Amboyna.

5. Sphex sericea, *Fabr. Syst. Piez.* p. 211. 19.

Hab. Waigiou; Ceram; Ternate; Timor; Bachian; Aru; Celebes; Malacca; Java; Borneo; Philippines.

6. Sphex ferox, *Smith, Proc. Linn. Soc.* vi. 55. 5.

Hab. Waigiou; Amboyna; Celebes.

Gen. Ammophila, *Kirby*.

1. Ammophila insolata, *Smith, Proc. Linn. Soc.* iii. 14. 2.
Hab. Timor; Celebes.

Gen. Pelopœus, *Latr.*

1. Pelopœus lætus, *Smith, Cat. Hym. Ins.* pt. iv. 229. 13.
Hab. Ceram; Australia (Port Essington and Swan River).

2. Pelopœus Bengalensis, *Dahlb. Hym. Eur.* i. 433. 2.
Hab. Timor; Ternate; Celebes; Isle of France; Philippines; India; China.

3. Pelopœus spirifex, *Linn. Syst. Nat.* i. 942. 9.
Hab. Timor; Africa; Europe.

4. Pelopœus murarius. *P.* ater; clypeo, flagello, pedibus abdomineque basi ferrugineis; alis hyalinis, apicibus maculis fuscis.
Female. Length 8 lines. Black; the scape, apex of the third joint of the antennæ, and the fourth joint, the palpi, mandibles, and clypeus ferruginous, the base of the latter black; the face covered with golden pubescence; the head and thorax thinly clothed with erect fulvous pubescence. Thorax: the legs ferruginous, with the coxæ and trochanters black; the wings hyaline, the nervures ferruginous, the tegulæ pale rufo-testaceous; the anterior wings with a fuscous spot at their apex; the metathorax transversely striated. Abdomen ferruginous, the petiole and the base of the third, fourth, and fifth segments black.
Hab. Ceram.

This species resembles the *P. fervens* from Sarawak, but is, I think, quite distinct; the petiole is shorter and thicker, and the thorax is opake black, without red markings, besides other differences.

Fam. LARRIDÆ, *Leach.*

Gen. Larrada, *Smith.*

1. Larrada modesta, *Smith, Proc. Linn. Soc.* iii. 159. 1.
Hab. Waigiou; Aru.

2. Larrada aurulenta, *Fabr. Syst. Piez.* p. 228.
Hab. Bouru; Bachian; Celebes; Philippines; Java; Sumatra; India; China; Cape of Good Hope; Gambia.

3. Larrada funerea. *L.* nigra, clypeo argenteo piloso; alis subhyalinis; abdomine lævi et nitido.
Female. Length $3\frac{1}{2}$ lines. Black; the head and thorax subopake; the tips of the mandibles rufo-piceous; the clypeus with silvery pubescence; the face with a deep central longitudinal impression above the antennæ, and one on each side equally deep. The metathorax truncate, margined at the sides and along the verge of the truncation by a raised line, the disk finely granulated and having a central longitudinal carina; the legs spinose, and frosted over as it were with silvery

pile; the wings subhyaline and iridescent. The abdomen shining and with a thin silky pile.

Hab. Waigiou.

4. LARRADA SABULOSA. *L.* nigra, facie metathoraceque aurato-pubescentibus, alis flavo-hyalinis.

Female. Length 8 lines. Black and slightly shining; a spot at the base of the mandibles and the face clothed with golden pubescence. A narrow border on the posterior margin of the prothorax, a line on each side of the mesothorax, and the metathorax above with rich golden pubescence; the tibiæ and tarsi strongly spined. Wings flavo-hyaline, the nervures ferruginous, the apical margins of the anterior pair fuscous. Abdomen smooth, with a silky gloss.

Hab. Ceram.

Gen. PISON, *Spin.*

1. Pison nitidus, *Smith, Proc. Linn. Soc.* iii. 160. 1.

Hab. Mysol; Aru; Key Island.

2. PISON PALLIDIPALPIS. *P.* niger, capite thoraceque punctatis; abdomine nitido, segmentorum marginibus argentatis.

Female. Length 5 lines. Black; the head and thorax closely and finely punctured; the clypeus, sides of the face, and inner orbits of the eyes, terminating in their sinus, with bright silvery pubescence; the tips of the mandibles rufo-piceous; the palpi pale testaceous; the cheeks silvery. Thorax: the sides and the legs with fine cinereous pubescence; the sides of the metathorax with longer silvery-white pubescence; a deep longitudinal channel runs down the middle from the base to the apex; the wings subhyaline, the nervures black, the tegulæ testaceous. Abdomen shining, closely and very delicately punctured; the apical margins of the segments with fasciæ of silvery pile, only observable in certain lights.

Hab. Ceram.

Fam. CRABRONIDÆ, *Leach.*

Gen. TRYPOXYLON, *Latr.*

1. TRYPOXYLON PLACIDUM. *T.* nigrum, clypeo argentato-pubescente; abdominis basi, mandibulis pedibusque ferrugineis; alis hyalinis, iridescentibus.

Female. Length $3\frac{3}{4}$ lines. Black; the face, inner orbits of the eyes, and the cheeks with silvery pubescence; the mandibles, tibiæ and tarsi ferruginous; the metathorax shining, the sides with a little silvery pubescence, the middle with a deep longitudinal furrow; the wings hyaline and iridescent, the nervures testaceous. Abdomen finely pubescent, with the three basal segments ferruginous, the third dusky above; beneath ferruginous, with the two apical segments slightly dusky.

Hab. Mysol.

2. TRYPOXYLON GRACILLIMUM. *T.* nigrum, clypeo argentato-pubescente; alis hyalinis, iridescentibus; tarsis rufo-testaceis.

Male. Length 7 lines. Black, and with a fine thin cinereous pubescence; the clypeus and inner orbits of the eyes with a dense silvery pubescence, the lower portions of the cheeks silvery; the palpi pale testaceous; the mandibles pale ferruginous. Thorax: the wings hyaline and beautifully iridescent, the nervures fuscous, the tegulæ testaceous; the meso- and metathorax finely punctured, the latter shining, with a dense silvery pubescence at the sides; in the centre a deep longitudinal impression, deepest in the middle; the articulations of the legs rufo-piceous; the tarsi rufo-testaceous. Abdomen: the petiole slender, longer than the three following segments; the margins of the apical segments narrowly rufo-piceous.

Hab. Mysol.

Gen. Arpactophilus.

Head large, subquadrate, wider than the thorax; eyes oval, distant, placed at the sides of the head; antennæ geniculated, scarcely longer than the head, inserted at the base of the clypeus, not approximated; the flagellum subfiliform, the first joint small, half the length of the following joints, which are cylindric and nearly of equal length; the scape short, slightly thickened towards the apex, and about the length of the five basal joints of the flagellum; the mandibles bidentate at their apex. Thorax ovate; the collar transverse; the scutellum transverse; the metathorax with an enclosed space at its base; *the superior wings with one marginal cell, narrowing beyond the second submarginal and subacute at its apex; submarginal cells two, the first oblong, receiving at its apex the first recurrent nervure, the second angular, truncate at its apex; discoidal cells two*; legs moderately strong, simple. Abdomen subsessile, incurved at its extremity.

This genus is closely allied to *Diodontus*, from which it differs in the neuration of the anterior wings, in wanting the second recurrent nervure, and in the bidentate mandibles, but in general habit it bears a close resemblance to that genus.

1. Arpactophilus bicolor. *A.* niger, pedibus abdomineque ferrugineis, alis fuscis.

Female. Length $3\frac{3}{4}$ lines. Head and thorax black, and sculptured with a coarse deep longitudinal striation, the striæ in parts running into a very coarse punctation; on the front of the head, above the insertion of the antennæ, it is transverse; the metathorax with a semicircular space at its base, enclosed by a slightly elevated ridge; above the antennæ is a central elevated carina, which terminates before reaching the anterior ocellus; the antennæ, mandibles, and legs ferruginous, the coxæ, trochanters, and femora beneath black; the palpi pale testaceous. The wings fuscous, palest at their apical and posterior margins. Abdomen shining, ferruginous, smooth and impunctate. The *male* differs in having the scape white in front.

Hab. Mysol.

Gen. Psen, *Latr.*

1. Psen petiolatus. *P.* capite thoraceque nigris, nitidis; abdomine pedibusque ferrugineis; alis hyalinis.

Female. Length 3 lines. Head and thorax smooth, shining, and impunctate; the antennæ, palpi, and mandibles ferruginous; the clypeus covered with silvery pubescence. Thorax: the tegulæ and legs pale ferruginous; the margin of the collar and sides of the thorax with glittering silvery-white pubescence; the mesothorax with two central impressed lines anteriorly and a slight scratch over the tegulæ; the wings hyaline and beautifully irideseent, the nervures testaceous. Abdomen: the petiole as long as the first segment and curved downwards; all the segments smooth, shining, and impunctate.

Hab. Mysol.

Fam. PHILANTHIDÆ.

Gen. Cerceris, *Latr.*

1. Cerceris immolator. *C.* nigra, facie, pedibus abdomineque flavo variegatis; alis hyalinis, apicibus fuscis.

Female. Length 4 lines. Black, and strongly punctured; the face, base of the mandibles, and the scape in front yellow; the flagellum fulvous beneath. Thorax: a spot on the tegulæ, the anterior and intermediate tibiæ and tarsi, and a spot at the base of the posterior tibiæ and tarsi yellow; the tips of the anterior and intermediate femora yellow, and their tibiæ with a black spot beneath; the wings subhyaline, with a fuscous spot at their apex. Abdomen: a transverse spot at the base of the second segment and a short line on each side of the second yellow; beneath, a minute yellow spot on each side of the third segment.

Hab. Waigiou.

Group I.—*SOLITARY WASPS.*

Fam. EUMENIDÆ, *Westw.*

Gen. Eumenes, *Latr.*

1. Eumenes Urvillei, *Sauss. Mon. Guêpes Sol.* i. 59. 44.

Hab. Ceram; Gilolo; New Guinea.

2. Eumenes arcuatus, *Fabr. Syst. Piez.* p. 287. 11.

Hab. Mysol; Waigiou; Bachian; Dory; Key Island; Singapore; Siam.

3. Eumenes Praslina, *Guér. Voy. Coq. Zool.* ii. 267. pl. 9. fig. 7.

Hab. Ceram; Gilolo; Kaisaa; Port Praslin; Key Island; Amboyna.

4. Eumenes agilis, *Smith, Proc. Linn. Soc.* v. 127. 8.

Hab. Ceram; Amboyna.

5. Eumenes tricolor, *Smith, Proc. Linn. Soc.* v. 87. 5.

Hab. Ceram; Celebes; Bouru.

6. Eumenes circinalis, *Fabr. Syst. Piez.* p. 286. 4.

Hab. Bouru; Gilolo; Kaisaa; Celebes; Ceram; Sumatra; Java; India.

7. Eumenes medianus. *E.* niger, flavo variegatus; pedibus ferrugineis; alis fusco-hyalinis.

Male. Length $5\frac{3}{4}$ lines. Black; the head, thorax, and first segment of the abdomen strongly punctured; the clypeus and a halberd-shaped spot above white; a spot at the base of the mandibles and the scape in front yellow; the mandibles ferruginous, with four black teeth on their inner margin. Thorax: a line on the prothorax anteriorly, its posterior margin, two quadrate spots on the clypeus, two oblique lines on the metathorax, a triangular spot beneath the wings, and the tegulæ yellow; the wings fusco-hyaline, darkest towards their apex, and slightly iridescent; the legs ferruginous, the tarsi fuscous. The apex of the petiole yellow, the abdomen smooth and shining.

Hab. Ceram.

8. Eumenes conformis. *E.* niger, flavo variegatus; capite thoraceque dense punctatis; alis fusco-hyalinis.

Female. Length $5\frac{1}{2}$ lines. Black; the base of the clypeus, a kite-shaped spot above and an abbreviated line behind the eyes yellow; the mandibles ferruginous. Thorax: the prothorax in front, the tegulæ, a spot beneath the wings, and two spots on each side of the metathorax yellow; the tips of the coxæ and femora, the tibiæ and tarsi pale ferruginous, the posterior tarsi and apical joints of the intermediate pair fuscous; the wings fusco-hyaline, darkest towards their apex. Abdomen punctured; the apex of the petiole, a spot on each side, the apical margin of the second segment and an ovate spot on each side yellow.

Hab. Ceram.

9. Eumenes volatilis. *E.* niger, flavo variegatus, capite thoraceque delicatule variegatis; alis subhyalinis; abdomine lævigato, nitido.

Female. Length 6 lines. Black and shining; the head and thorax delicately punctured; the clypeus, an oblong lancet-formed spot above, a spot in the sinus of the eyes and a line behind them yellow; the scape in front yellow, the flagellum orange beneath; an anchor-shaped black spot on the clypeus. The anterior margin of the thorax, a line on each side of the mesothorax in front curving inwards, the tegulæ and a spot beneath the wings, a spot on each side of the scutellum, a broad curved line on each side of the metathorax, the anterior legs and the intermediate tibiæ in front yellow; the claw-joint of the tarsi rufo-piceous; the wings slightly coloured and iridescent; a black spot in the middle of the tegulæ. Abdomen: the petiole as long as the thorax; the apical margins of the segments narrowly bordered with yellow; a minute yellow spot on each side of the second segment near its base.

Hab. Mysol.

10. Eumenes pullatus. *E.* nigerrimus, alis flavescentibus.

Female. Length 10 lines. Opake black, the flagellum white beneath; the head and thorax covered with confluent punctures; the wings yellow, subhyaline; the petiole of the abdomen regularly widening from the base to the apex. Closely resembling species of the genus *Zethus*.

Hab. Ceram.

11. Eumenes perplexus. *E.* aterrimus; petiolo perlongo, medio et apice maculis duabus albis; alis fulvo-hyalinis.

Female. Length 12 lines. Jet-black, with the abdomen shining; the wings fulvo-hyaline; the petiole of the abdomen elongate, with two white spots in the middle and two at the apex.

Hab. Bouru.

Of the same size and form as *E. arcuatus*, and probably a black variety of that species.

12. Eumenes diligens. *E.* niger, flavo variegatus; capite, thorace petioloque delicatule punctatis; abdomine nitido; alis anticis fusco-hyalinis, violaceo-iridescentibus.

Female. Length 7 lines. Black; the basal half of the clypeus, a battledore-shaped spot above, the inner margin of the eyes as high as their emargination, and an abbreviated narrow line behind them yellow; the clypeus emarginate in front. Thorax: the anterior margin of the prothorax, an oblique line on each side of the mesothorax, a broader one beneath the wings, the posterior margin of the tegulæ and a spot before and behind them, a line at the base and apex of the scutellum and a broad oblique one on each side of the metathorax yellow; a line on the outside of the anterior tibiæ and a spot on the intermediate and posterior coxæ yellow; wings brownish, with a violet and, in some lights, coppery iridescence. Abdomen: the petiole elongate, punctured, its apex with a narrow yellow margin; the following segment bordered with yellow.

Hab. Bouru.

Gen. Rhynchium, *Spin.*

1. Rhynchium hæmorrhoïdale, *Fabr. Syst. Piez.* p. 259. 28.

Hab. Ceram; Gilolo; Bachian; Dory; Malacca; Singapore; India.

2. Rhynchium metallicum, *Sauss. Mon. Guêpes Sol.* i. 114. 21.

Hab. Ceram; Bachian; Sarawak; India.

3. Rhynchium parentissimum, *Sauss. Mon. Guêpes Sol.* p. 111. 14 (var. R. hæmorrhoïdale?).

Hab. Timor; Celebes; Java; India.

Gen. Odynerus, *Latr.*

1. Odynerus agilis, *Smith, Proc. Linn. Soc.* iii. 164. 2.

Hab. Waigiou; Aru.

2. Odynerus insularis, *Smith, Proc. Linn. Soc.* iii. 21. 3.

Hab. Makassar.

3. Odynerus fallax. *O.* niger, capite thoraceque flavo variegatis, tarsis pallide flavis, alis hyalinis; abdomine petiolato, segmentorum marginibus flavo fasciatis.

Female. Length $4\frac{3}{4}$ lines. Black; the head and thorax punctured, the disk of the mesothorax strongly so; the clypeus, mandibles, a bifurcate spot above, the inner margin of the eyes as high as their emargination, and the scape in front yellow; the base and apex of the mandibles rufo-piceous; the head is covered with a fine cinereous down, especially the cheeks. The anterior and posterior margins of the prothorax, the tegulæ, a spot on each side of the scutellum and postscutellum, the sides of the metathorax, a spot beneath the wings, the anterior and intermediate tibiæ, the knees and the tarsi pale yellow; the claw-joint of the tarsi pale ferruginous; the wings hyaline and iridescent. Abdomen petiolated, of a brownish black; the margins of the segments bordered with yellow.

Hab. Mysol.

4. Odynerus conspicuus. *O.* flavo-ferrugineus, capite thoraceque nigro maculatis; alis hyalinis, paris superioris margine antico fusco.

Female. Length $3\frac{3}{4}$ lines. Yellowish red; the face, thorax at the sides and beneath yellow; the clypeus yellow, its anterior margin angular; the vertex black; the flagellum fuscous above. The mesothorax black, with a longitudinal broad black mark in the middle, which is pointed towards the prothorax; a narrow black line runs across the scutellum, postscutellum, and down the truncation of the metathorax; the wings hyaline, the anterior margin of the superior pair dark fuscous. Abdomen: the posterior margin of the basal segment constricted and yellow; the second segment has also a narrow yellow border.

Hab. Mysol.

5. Odynerus sobrinus. *O.* ferrugineus; capite, thorace abdomineque nigro variis; abdominis segmentis flavo fasciatis.

Female. Length $4\frac{1}{4}$ lines. Ferruginous; the clypeus and a spear-shaped mark above, the orbits of the eyes, the base of the mandibles, and the scape in front yellow; a transverse curved yellow line on the vertex, extending to the orbits of the eyes; the scape dusky above. Thorax: the scutellum and postscutellum yellow, bordered with black; two longitudinal yellow lines on the mesothorax, the space between them black; the sides and beneath black; a spot under the wings, and the coxæ yellow; the wings subhyaline, with the anterior margin of the superior pair narrowly fuscous. The posterior margins of the segments of the abdomen yellow; the basal segment with a minute spot in the middle, the second with a large triangular one at the base and a larger one at its apical margin black (the points of the angular

shapes uniting in the middle), the following segments black; beneath, the two basal segments red, the second with two ovate yellow spots.

Hab. Ceram.

6. Odynerus laboriosus. *O.* niger; capite thoraceque distincte, abdomine delicatule punctatis; abdominis segmentis duobus basalibus flavo faseiatis.

Male. Length 4 lines. Black; head and thorax strongly and closely punctured; the clypeus, a triangular spot above it, a line on the inner margin of the eyes terminating in their sinus, and an abbreviated line behind them yellow; an interrupted line on the prothorax, the anterior tibiæ and tarsi, a line on the intermediate and posterior tibiæ yellow; the tarsi fulvous; the wings subhyaline, the anterior margin of the superior pair fuscous. Abdomen shining and delicately punctured, a yellow band on the posterior margins of the first and second segments.

Hab. Mysol.

Group II.—*SOCIAL WASPS.*

Fam. VESPIDÆ, *Steph.*

Gen. Ischnogaster, *Sauss.*

1. Ischnogaster iridipennis, *Smith, Proc. Linn. Soc.* iii. 166. 1.

Hab. Mysol; Aru.

2. Ischnogaster unicolor. *I.* niger, pedibus obscure ferrugineis; alis irideseentibus, cellulis prima secundaque submarginalibus æqualibus, tertia breviore et ad cellulam marginalem angustata.

Male. Length 8 lines. Black; the abdomen shining; the clypeus produced, concave or spoon-shaped at the apex, the concavity smooth and shining; the twelfth joint of the antennæ and the basal half of the thirteenth pale testaceous. The posterior margin of the prothorax narrowly, but obscurely, rufo-piceous; the legs obscure rufo-fuscous, the anterior pair more or less rufo-testaceous; the wings fusco-hyaline and irideseent, the marginal cell clouded.

Var. The thorax at the sides and beneath ferruginous, with the legs paler.

Hab. Mysol; Waigiou.

Gen. Icaria, *Sauss.*

1. Icaria maculiventris, *Sauss. Mon. Guêpes Soc.* p. 23. 1. (Rhopalidia maculiventris, *Guér. Voy. Coq. Zool.* ii. pt. 2. *Ins.* p. 267, pl. 9. f. 8.)

Hab. Mysol; New Guinea; Aru.

2. Icaria nigra, *Smith, Proc. Linn. Soc.* iii. 167. 2.

Hab. Mysol; Aru.

3. Icaria impetuosa, *Smith, Proc. Linn. Soc.* v. 131. 2.

Hab. Ceram; Bachian; Amboyna.

4. Icaria ferruginea, *Sauss. Mon. Guêpes Soc.* p. 38. 17.
Hab. Ceram; Celebes; India.

5. Icaria morosa. *I.* nigra, opaca, pube sericea vestita; alis subhyalinis; abdominis segmentis primo et secundo margine flavo fasciatis.
Female. Length $4\frac{1}{2}$ lines. Black, opake, and thinly covered with a silky cinereous pile; the base of the mandibles, a spot on each side of the clypeus and another on each side of the face, touching the eyes, yellow; the scape ferruginous at the outer side, and the flagellum obscurely testaceous beneath towards its apex; the head closely punctured. Thorax strongly and closely punctured; wings subhyaline, the nervures dark fuscous. Abdomen: the apical margins of the first and second segments bordered with yellow; the margin of the first strongly constricted; finely and closely punctured.
Hab. Waigiou.

6. Icaria irritata. *I.* nigra; clypeo antice angulato; abdominis segmentis flavo fasciatis.
Female. Length $4\frac{1}{4}$ lines. Black, punctured, and shining; very thinly covered with a fine cinereous pile, which is most dense on the cheeks and abdomen; a yellow spot at the base of the mandibles; the flagellum rufo-testaceous beneath towards the apex. The wings subhyaline, the anterior margin of the superior pair narrowly fuscous. Abdomen: the apical margin of the basal segment with a very narrow yellow fascia, all the following segments with broad fasciæ.
Hab. Mysol.

7. Icaria torrida. *I.* capite thoraceque ferrugineis, abdomine fusco.
Female. Length 4 lines. The head, thorax, legs, and petiole of the abdomen ferruginous; the clypeus produced into a sharp angle at its anterior margin; the wings subhyaline, with a fuscous cloud in the marginal cell. Abdomen: the second and following segments black; thinly covered with cinereous pile.
Hab. Ceram.

8. Icaria deceptor. *I.* ferruginea; thorace flavo maculato; abdominis segmento secundo flavo marginato; alis hyalinis.
Female. Length $5\frac{1}{4}$ lines. Ferruginous; a pale testaceous yellow spot in the middle of the clypeus, and a line of the same colour at the inner margin of the eyes; the scape yellow in front. The prothorax with the anterior margin yellow; the tegulæ, a spot beneath the wings, a spot on the coxæ, a mark beneath the anterior and intermediate femora, the scutellum, postscutellum, and a broad stripe on each side of the metathorax pale yellow; the wings hyaline, the anterior margin of the superior pair narrowly fuscous, and also a fuscous cloud in the marginal cell. The apical margins of the segments of the abdomen bordered with yellow, interrupted on the fourth and fifth segments.
Hab. Mysol.

Gen. Polistes, *Latr.*

1. Polistes tepidus, *Fabr. Syst. Piez.* p. 271. 7.
Hab. Waigiou; Mysol; Aru; Key; Bachian; Solomon Island; New Guinea; Australia.

2. Polistes diabolicus, *Sauss. Mon. Guêpes Soc.* p. 68. 27, t. 6. f. 7.
Hab. Ceram; Aru; Timor; Java.

3. Polistes elegans, *Smith, Proc. Linn. Soc.* iii. 169. 5.
Hab. Mysol; Ceram; Aru; Key Island.

4. Polistes nigrifrons, *Smith, Proc. Linn. Soc.* iii. 168. 4.
Hab. Waigiou; Aru.

5. Polistes Picteti, *Sauss. Mon. Guêpes Soc.* iv. 22. 2.
Hab. Goram; Amboyna; Bouru; Celebes; Ceram; Australia.

6. Polistes Smithii, *Sauss. Mon. Guêpes Soc.* p. 60. 17.
Hab. Mysol; Africa.

7. Polistes stigma, *Fabr. Syst. Piez.* p. 261. 41.
Hab. Ceram; Celebes; India.

8. Polistes fastidiosus, *Sauss. Mon. Guêpes Soc.* p. 60. 18.
Hab. Mysol; Africa.

In the specimen from Mysol the yellow markings of the thorax are almost obsolete, but the metathorax is transversely striated, and in all important specific characters it agrees with specimens from Africa.

Gen. Polybia, *Sauss.*

1. Polybia limatula. *P.* nigra, alis subhyalinis; abdomine ferrugineo, marginibus apicalibus flavis.
Female. Length 6 lines. Head, antennæ, thorax, and legs black; a pale spot at the base of the mandibles, and the antennæ and tarsi rufo-fulvous beneath; thinly covered with cinereous down; the wings subhyaline, the anterior pair slightly yellowish along the costa. The abdomen ferruginous, more or less dusky in different specimens, with a narrow yellow border to all the segments; the basal segment campanulate, not bordered beneath.
Hab. Mysol.

Gen. Vespa, *Linn.*

1. Vespa affinis, *Fabr. Syst. Piez.* p. 254. 2 (var. V. cincta?).
Hab. Ceram; Mysol; Gilolo; Bachian; Amboyna; Dory; Malacca; Java; India; China.

2. V. Alduini, *Sauss. Mon. Guêpes Soc.* p. 154. 38.
Hab. Ceram.

Note.—Specimens from Ceram have the head obscure red, and also more coarsely rugose, as is also the metathorax; still, as Saussure suggests, it may possibly be a variety of *V. cincta.*

3. Vespa Philippinensis, *Sauss. Mon. Guêpes Soc.* p. 148.
Hab. Bouru; Amboyna; Philippine Islands.

4. Vespa unicolor. *V.* nigra, velutina; alis flavis, basi rufo-fuscis.
Female. Length 15 lines. Black; the clypeus coarsely rugose, the rest of the head rather finely punctured. The abdomen somewhat shining towards the base, the base of the second segment with a fine changeable cinereous pile; the wings yellowish hyaline, becoming of a reddish brown towards the base; the nervures black at the base of the wings and rufo-testaceous at their apex.
Hab. Bouru.

This species closely resembles *Vespa deusta* of St. Fargeau, but is a distinct species; in *V. deusta* the eyes extend to the base of the mandibles, which is not the case in the present species, and the clypeus and postscutellum are black.

Fam. ANDRENIDÆ, *Leach.*

Gen. Prosopis, *Fabr.*

1. Prosopis apicata. *P.* ferruginea, vertice abdomineque nigris; alis hyalinis, dimidio apicali fusco.
Female. Length $3\frac{3}{4}$ lines. Ferruginous; head and abdomen shining; the vertex and mandibles black, the latter ferruginous at their tips; the clypeus and sides of the face pale flavo-testaceous; the antennæ fuscous, the scape and flagellum beneath obscurely rufo-testaceous; the wings with their basal half hyaline, the apical brown; the posterior pair clear and beautifully iridescent. Abdomen: the three basal segments ferruginous, the apical ones black.
Hab. Mysol.

2. Prosopis lusoria. *P.* nigra, capite thoraceque albo pictis; abdominis segmentis primo et secundo albo maculatis.
Female. Length 4 lines. Black; the head and thorax closely punctured; a line at the orbits of the eyes, interrupted above, and another running from the anterior stemma to the frontal margin of the clypeus, white; the scape ferruginous in front, the flagellum fulvous beneath. Thorax: the collar, tubercles, three spots in a line beneath the wings, two narrow longitudinal stripes on the disk of the mesothorax, a line over the tegulæ, and a spot on each side of the scutellum and postscutellum white; the triangular space at the base of the metathorax longitudinally striated. Abdomen closely and finely punctured; a narrow line or spot on each side of the two basal segments; the three apical segments thinly covered with cinereous pubescence.
Hab. Mysol.

3. Prosopis imperialis. *P.* capite thoraceque viridi-cyaneis, abdominis segmentis basalibus purpureo variegatis.

Female. Length 4¼ lines. Head, thorax, and legs bright green, the legs obscurely so; the face shining, with a reversed T-shaped mark on the clypeus, a minute spot between the antennæ, and a narrow line along the inner orbit of the eyes white. The wings slightly coloured, with the nervures black; the first and second segments of the abdomen with a purple lustre.

Hab. Dory.

By an oversight, this beautiful and unique insect was omitted in a former paper descriptive of the insects of Bachian, Dory, &c.

Gen. Nomia, *Latr.*

1. Nomia dentata, *Smith, Proc. Linn. Soc.* iii. 133. 3.

Hab. Mysol; Waigiou; Aru.

2. Nomia concinna, *Smith, Proc. Linn. Soc.* v. 91. 1.

Hab. Ceram; Makassar.

3. Nomia iridescens, *Smith, Proc. Linn. Soc.* ii. 43. 2.

Hab. Bouru; Malacca; India.

4. Nomia bidentata. *N.* nigra et punctata, clypeo pallide testaceo; scutello bidentato; abdomine nitido; alis hyalinis.

Male. Length 4½ lines. Black; the clypeus, labrum, and mandibles pale testaceous, also a testaceous spot above the clypeus; the antennæ obscurely fulvous beneath. Thorax: the scutellum emarginate behind, and having an acute short spine at the lateral posterior angles; the wings hyaline and iridescent, with the nervures blackish; the legs obscure rufo-piceous. The abdomen smooth, shining, and finely punctured.

Hab. Mysol.

5. Nomia florea. *N.* nigra, capite thoraceque subopacis; abdomine nitido, basi rufo-ferrugineo; alis hyalinis.

Male. Length 4¼ lines. Black; the clypeus, labrum, and mandibles pale testaceous, the latter ferruginous at their tips; the scape testaceous, and slightly ferruginous above. Thorax: the wings hyaline and iridescent, the nervures rufo-testaceous; the coxæ dark brown; the legs pale rufo-testaceous, the posterior tibiæ rufo-fuscous above. The abdomen pale rufo-testaceous beneath; above shining black, with the base rufo-ferruginous.

Hab. Mysol.

6. Nomia metallica. *N.* viridi-ænea, punctata; facie pube brevi cinerea tecta; femoribus posticis flocco pallido, tibiis externe fusco-pubescentibus; alis hyalinis.

Female. Length 4¼ lines. Dark metallic green, with bright tints of green in certain lights; the clypeus black, smooth and shining at

the apex; the tips of the mandibles rufo-piceous; the flagellum fulvous beneath; the face with a thin griseous pubescence. Thorax closely punctured; the posterior margin of the scutellum and the sides of the thorax fringed with pale pubescence; the wings hyaline, with their apical margins clouded, the nervures black; the legs with a short black pubescence. Abdomen shining and finely punctured.

Hab. Waigiou.

7. Nomia similima. *N.* nigra, facie thoraceque cinereo-pubescentibus; thorace pallide ferrugineo; abdominis segmentorum marginibus apicalibus fulvo-testaceo late fasciatis.

Female. Length 4 lines. Black; the apical margin of the clypeus, the labrum and mandibles pale rufo-testaceous, the tips of the mandibles ferruginous; the face covered with cinereous pubescence. Thorax covered above with cinereous pubescence, in recent specimens probably tinged with yellow; the tegulæ pale rufo-testaceous, the wings hyaline and iridescent, the nervures obscure ferruginous; the legs pale ferruginous. Abdomen closely punctured, the apical margins of the segments broadly testaceous.

Hab. Ceram.

This species resembles *N. uncta* from Key Island, but it is quite distinct; its large pale tegulæ would alone distinguish it; its head is much narrower and its clypeus much more produced.

Fam. DASYGASTRÆ, *Leach.*

Gen. Megachile, *Latr.*

1. Megachile Alecto, *Smith, Proc. Linn. Soc.* v. 134. 4.
Hab. Mysol; Dory; Gilolo.

2. Megachile Lachesis, *Smith, Proc. Linn. Soc.* v. 133. 2.
Hab. Mysol; Bachian; Amboyna; Ceram; Bouru.

3. Megachile placida, *Smith, Proc. Linn. Soc.* vi. 60. 5.
Hab. Mysol; Gilolo.

4. Megachile scabrosa, *Smith, Proc. Linn. Soc.* iii. 134. 2.
Hab. Bouru; Aru.

5. Megachile fulvifrons, *Smith, Proc. Linn. Soc.* iii. 6. 2.
Hab. Timor; Celebes.

6. Megachile funeraria. *M.* aterrima, pube nigra vestita; thorace transversim rugoso et longitudinaliter sulcato; abdomine obscure violaceo-micante; alis hyalinis, apicibus marginalibus fuscis.

Female. Length 9½ lines. Jet-black; the pubescence on the head black; the vertex smooth and shining, the cheeks and clypeus rugose, the latter subcarinate in the centre; the mandibles smooth, with a

few scattered punctures, and armed with two teeth at their apex, a third tooth being slightly developed. Thorax: the upper surface transversely rugose and with four longitudinal impressed lines; the sides and beneath with a dense black pubescence; the wings smoky hyaline, with the nervures black; the tibiæ rugose on the outside and set with rigid hairs, the tarsi thickly pubescent. Abdomen shining, with a changeable purple and violet iridescence, sparingly and finely punctured; beneath thickly clothed with black pubescence.

Hab. Bouru.

Gen. Cœlioxys, *Latr.*

1. Cœlioxys intrudens, *Smith, Proc. Linn. Soc.* v. 132. 1.

Hab. Bouru; Bachian.

Gen. Nomada, *Fabr.*

1. Nomada insularis. *N.* atra; antennis, pedibus abdomineque ferrugineis; alis hyalinis, iridescentibus.

Female. Length 2 lines. Head and thorax strongly and closely punctured; the antennæ, clypeus, inner orbits of the eyes, labrum and mandibles ferruginous. Thorax: the scutellum, postscutellum, tegulæ, a large patch beneath the wings, and the legs ferruginous; the wings hyaline and iridescent, the nervures testaceous. Abdomen ferruginous, the base, and the apical margins of the second and third segments rufo-piceous.

Hab. Ceram.

2. Nomada conspicua. *N.* atra, clypei margine anguste flavo; antennis subtus pedibusque anticis et intermediis ferrugineis; abdominis segmentis duobus albo maculatis.

Male. Length $2\frac{1}{2}$ lines. Black; the anterior margin of the clypeus, the labrum and mandibles yellow; the antennæ ferruginous beneath. Thorax: the scutellum with two obscure ferruginous spots, the anterior and intermediate legs, the posterior femora beneath, and the tibiæ at their apex, as well as the tarsi, ferruginous; the wings hyaline, their apical margins clouded. Abdomen gradually widened from the base to the middle of the second segment, and from thence rounded to the apex, being somewhat pearshaped; an ovate white macula at the lateral margin of the second segment, and a short white line a little beyond it; beneath rufo-testaceous.

Hab. Timor.

Gen. Crocisa, *Jur.*

1. Crocisa nitidula, *Fabr. Syst. Piez.* p. 386. 2.

Hab. Mysol; Waigiou; Gilolo; Ternate; Aru Islands; Amboyna; Menado; Australia; Ceram; Timor.

Gen. Xylocopa, *Latr.*

1. Xylocopa perforator, *Smith, Proc. Linn. Soc.* vi. 61. 4.
Hab. Timor; Ternate.

2. Xylocopa æstuans, *Linn. Syst. Nat.* i. 961. 53.
Hab. Timor; Celebes; Java; Singapore; India.

3. Xylocopa unicolor, *Smith, Proc. Linn. Soc.* v. 135. 2.
Hab. Bouru; Amboyna.

4. Xylocopa provida. *X.* nigra, pube nigra vestita; thorace postice pube flava decorato; alis nigro-fuscis. (*Fœmina.*)—Flava, tibiis posticis intus nigro hirtis; alis fusco-hyalinis, apicibus nigro minute et regulariter crebre punctatis. (*Mas.*)

Female. Length $8\frac{1}{2}$ lines. Black, and clothed with black pubescence; the face with a thin griseous pubescence; the flagellum, except the two basal segments, fulvous beneath. The thorax clothed with bright yellow pubescence; behind the wings light brown.

Male. Length 10 lines. Clothed with pale fulvous-yellow pubescence; antennæ as in the female. The anterior legs elongate, the tarsi with a long fringe of pubescence outside; the posterior legs curved inwards; clothed outside with yellow, and inside with black pubescence; the wings subhyaline, with a fine cupreous iridescence.

Hab. Mysol; Waigiou.

Gen. Anthophora, *Latr.*

1. Anthophora zonata, *Linn. Syst. Nat.* i. 955. 19.
Hab. Mysol; Waigiou; Gilolo; Bachian; Celebes; Dory; Borneo; Java; India; Hong Kong; Shanghai; Philippine Islands; Ceram.

2. Anthophora elegans, *Smith, Proc. Linn. Soc.* iii. 135. 2.
Hab. Ceram; Amboyna; Key Island.

Subfam. Sociales.

Gen. Apis, *Linn.*

1. Apis dorsata, *Fabr. Syst. Piez.* p. 370.
Hab. Timor; India; Malacca; Borneo.

2. Apis socialis, *Latr. Voy. Humb. & Bonpl.*
Hab. Timor; Ternate; Java; Malabar.

Catalogue of the Heterocerous Lepidopterous Insects collected at Sarawak, in Borneo, by Mr. A. R. Wallace, with Descriptions of New Species. By Francis Walker, Esq., F.L.S.

[Continued from vol. vi. p. 198.]

Fam. ACONTIDÆ, *Guén.*

Gen. Xanthodes, *Guén.*

270. Xanthodes intersepta, *Guén. Noct.* ii. 212. 979.
Inhabits also Hindostan and Ceylon.

Gen. Acontia, *Ochs.*

271. Acontia marginalis, n. s. *Mas et Fœm.* Albida, capite thoraceque antico subochraceis, alis anticis acutis bilineatis, costa spatioque marginali ochraceis, striga marginali alba.

Male and Female. Whitish. Head and fore part of the thorax tinged with ochraceous. Palpi ascending; 2nd joint curved; 3rd lanceolate, about half the length of the 2nd. Antennæ of the male hardly pubescent. Fore wings acute; costa and marginal space ochraceous; this hue very irregular in outline, but most prevalent in front, where it includes a white marginal streak; two oblique lines, the exterior one black-speckled, more distinct than the other. Length of the body 4 lines; of the wings 10 lines.

272. Acontia leucophæa. *Mas.* Alba, subiridescens, alis anticis apice subrotundatis, linea obliqua vix arcuata punctoque discali fuscis, strigis tribus costalibus subapicalibus nigris, punctis marginalibus nigris, alis posticis nigro-cinereis.

Male. White, shining, slightly iridescent, blackish cinereous beneath. Palpi ascending, smooth; 2nd joint curved; 3rd lanceolate, less than half the length of the 2nd. Antennæ minutely pubescent. Abdomen attenuated, extending somewhat beyond the hind wings. Fore wings slightly rounded at the tips, with a hardly curved brown line which extends from the tips to near the base of the interior border; discal point brown; three minute black streaks towards the tip of the costa; space along the interior border with some brown speckles, a few of which are confluent; marginal points black. Hind wings blackish cinereous. Length of the body 5 lines; of the wings 10 lines.

273. Acontia roseo-nivea, n. s. *Mas.* Alba, capite ferrugineo, alis fascia submarginali fusca, spatio marginali roseo, alis anticis acutis puncto discali nigro liturisque costalibus fuscis.

Male. White, with a testaceous tinge beneath. Head ferruginous. Palpi short, slender, porrect, not extending beyond the head. Antennæ distinctly pubescent. Wings with an irregular brown submarginal band; marginal space with a rosy tinge. Fore wings acute,

with a black discal point and with some brown costal marks; submarginal band bordered with white on the outer side. Length of the body 4 lines; of the wings 10 lines.

274. Acontia inordinata, n. s. *Fœm.* Alba, fusco subconspersa, abdomine alisque posticis cinereis, alis anticis litura discali strigaque posteriore nigris, maculis tribus subtrigonis costalibus plagaque marginali nigro notata fuscis, fimbria fuscescente.

Female. White, slightly brown-speckled Palpi obliquely ascending; 3rd joint elongate-conical, not more than one-fourth of the length of the 2nd. Abdomen and hind wings cinereous. Fore wings with an irregular black discal mark, whence an irregular black streak proceeds inward to the interior border; three brown nearly triangular costal spots, and a brown marginal patch which contains some black marks; fringe brownish. Length of the body 3 lines; of the wings 8 lines.

275. Acontia xanthophila, n. s. *Fœm.* Lutescens, palpis albis articulo 3° cinereo, abdomine albo, alis anticis subrotundatis vix lineatis, alis posticis albis iridescentibus semihyalinis.

Female. Luteous yellow, paler beneath. Palpi white, obliquely ascending; 3rd joint cinereous, elongate-conical, less than half the length of the 2nd. Abdomen white, hardly extending beyond the hind wings. Fore wings slightly rounded at the tips, with some almost obsolete indications of transverse lines. Hind wings white, iridescent, semihyaline. Length of the body 4 lines; of the wings 9 lines.

276. Acontia? indecisa, n. s. *Fœm.* Flava, palpis cinereo-fuscis, abdomine cinereo-fusco, alis anticis linea lutea obliqua vix conspicua, linea exteriore undulata e atomis nigris, spatio marginali ochraceo, punctis marginalibus nigris, alis posticis cinereo-fuscis.

Female. Yellow. Palpi cinereous brown, slightly ascending, extending far beyond the head; 2nd joint broad, pilose; 3rd elongate-conical, less than half the length of the 2nd. Abdomen pale cinereous. Fore wings with an oblique very indistinct luteous line, and with a few black speckles; exterior line undulating, composed of black speckles, obsolete in front; space beyond this line ochraceous, black-speckled; marginal points black. Hind wings and underside cinereous brown. Length of the body $3\frac{1}{2}$ lines; of the wings 9 lines.

277. Acontia? sordida, n. s. *Fœm.* Sordide cinerea, abdomine alisque posticis pallidioribus, alis anticis acutis fusco conspersis, litura discali punctoque apicali nigris, lineis duabus vix conspicuis, punctis costalibus punctisque submarginalibus pallidis, fimbria fusca, alis posticis linea marginali fusca.

Female. Dingy cinereous. Second joint of the palpi broad, slightly fringed. Abdomen and hind wings paler. Fore wings acute, brown-speckled, with an irregular black discal mark and with a black apical point; some slight traces of two irregular lines; a few pale costal

points and a row of pale submarginal points; fringe brown. Hind wings with a brown marginal line. Length of the body 2½ lines; of the wings 7 lines.

278. Acontia? cuprina, n. s. Cupreo-rufescens, abdomine alisque posticis ferrugineo-cinereis, palpis porrectis, alis anticis nigro subconspersis apice subrotundatis, nota reniformi nigro notata et marginata, lineis duabus nigricantibus undulatis vix conspicuis, fimbria rufescente, margine interiore subexcavato.

Cuprcous reddish, paler beneath. Abdomen and hind wings cinereous, with a ferruginous tinge. Palpi porrect; 3rd joint conical, less than half the length of the 2nd. Abdomen not extending beyond the hind wings. Fore wings minutely black-speckled, slightly rounded at the tips; reniform mark nearly round, slightly black-pupilled and -bordered; interior and exterior lines blackish, undulating, very indistinct; fringe dark reddish; interior border slightly excavated exteriorly. Length of the body 4 lines; of the wings 10 lines.

Gen. Dyrzela, *Walk.*

279. Dyrzela incrassata, *Walk. Cat. Lep.* 3rd ser. 1759.

280. Dyrzela parallela, n. s. *Mas et Fœm.* Purpureo-fusca, alis anticis lineis tribus fuscis subobliquis fere parallelis, macula magna costali cupreo-fusca cinereo marginata, punctis marginalibus nigris, alis posticis cupreo-fuscis.

Male. Brown, with purple reflexions. Palpi obliquely ascending, extending far beyond the head; 3rd joint less than half the length of the 2nd. Antennæ moderately pectinated to much beyond half the length. Abdomen elongate-conical, hardly extending beyond the hind wings. Legs thick, fringed. Fore wings with three nearly parallel slightly oblique brown lines; a large dark cupreous-brown cinereous-bordered costal spot beyond the 3rd line; marginal points black. Hind wings cupreous brown. Length of the body 5 lines; of the wings 10 lines.

Female. Third joint of the palpi much more than half the length of the 2nd. Antennæ bare. Fore wings with the lines more undulating; 1st line blackish, broader and more distinct than the other two; costal spot more excavated on the outer side.

Gen. Garella, n. g.

Fœm. Corpus robustum. *Proboscis* brevis. *Palpi* oblique ascendentes, verticem superantes; articulus 3us linearis, 2° non brevior. *Antennæ* nudæ. *Abdomen* alas posticas paullo superans. *Pedes* validi; tibiæ posticæ calcaribus quatuor longis. *Alæ* anticæ apice rotundatæ, costa convexa, margine exteriore subconvexo vix obliquo.

Female. Body stout. Proboscis short. Palpi obliquely ascending, rising higher than the vertex; 3rd joint linear, rounded at the tip, as

long as the 2nd. Antennæ smooth. Abdomen extending a little beyond the hind wings. Legs stout; hind tibiæ with four long spurs. Wings moderately broad. Fore wings rounded at the tips; costa convex; exterior border slightly convex, hardly oblique.

281. GARELLA ROTUNDIPENNIS, n. s. *Fœm.* Schistacea, subtus nigro-cinerea, abdomine alisque posticis obscure cinereis, alis anticis lineis nonnullis angulosis interruptis, fascia basali diffusa fusca, guttis submarginalibus punctisque marginalibus nigris.

Female. Slaty cinereous, blackish cinereous beneath. Abdomen and hind wings dark cinereous, iridescent. Fore wings with some zigzag interrupted black lines; a diffuse brown band near the base; submarginal line composed of black dots; marginal points black. Length of the body 4 lines; of the wings 10 lines.

Gen. BANTANA, n. g.

Fœm. Corpus robustum. *Proboscis* distincta. *Palpi* ascendentes, compressi, verticem superantes; articulus 3us longi-fusiformis, 2° non brevior. *Antennæ* subpubescentes. *Abdomen* alas posticas non superans. *Pedes* læves; tibiæ posticæ calcaribus quatuor longissimis. *Alæ* latiusculæ, breviusculæ; anticæ apice rectangulatæ, costa margineque exteriore vix convexis.

Female. Body stout. Proboscis distinct. Palpi erect, compressed, not broad, rising higher than the vertex; 3rd joint elongate-fusiform, as long as the 2nd. Antennæ minutely pubescent. Abdomen not extending beyond the hind wings. Legs smooth, moderately stout; hind tibiæ with four very long spurs. Wings rather broad and short. Fore wings rectangular at the tips; costa and exterior border hardly convex, the latter hardly oblique.

282. BANTANA ALBIDA, n. s. *Fœm.* Albida, nigro conspersa, thorace antico fusco, abdomine alisque posticis cinereo-fuscis, alis anticis fasciis duabus diffusis fuscis, 2^{a} marginali, lineis duabus nigris flexis, 1^{a} incompleta, linea submarginali nigra angulosa.

Female. Whitish, black-speckled. Thorax brown in front. Abdomen, hind wings, and underside cinereous brown. Fore wings with two irregular and diffuse brown bands; 2nd band marginal; interior and exterior lines black, bent; the former incomplete; a slight intermediate line which is obsolete in front; submarginal line black, zigzag. Hind wings with an æneous tinge. Length of the body 4¼ lines; of the wings 11 lines.

Gen. CORTICATA, n. g.

Fœm. Corpus robustum. *Proboscis* brevis. *Palpi* oblique ascendentes, verticem non superantes; articulus 3us lanceolatus, 2° vix brevior. *Antennæ* nudæ, graciles. *Abdomen* alas posticas paullo superans.

Pedes læves. *Alæ* anticæ sat angustæ, apice rectangulatæ, costa vix convexa, margine exteriore non convexo.

Female. Body stout. Proboscis short. Palpi obliquely ascending, not rising higher than the vertex; 3rd joint lanceolate, nearly as long as the 2nd. Antennæ smooth, slender. Abdomen extending a little beyond the hind wings. Legs smooth. Wings rather narrow. Fore wings rectangular at the tips; costa very slightly convex; exterior border slightly oblique, not convex.

283. Corticata scoparioides, n. s. *Fœm.* Schistacea, thorace fascia nigra, alis anticis fusco subtinctis, maculis duabus costalibus fuscis ex parte nigro marginatis, lineis pallide cinereis denticulatis flexis nigro notatis, punctis marginalibus nigris, alis posticis cinereis semihyalinis.

Female. Slaty cinereous. Thorax with a black band in front. Abdomen cinereous, slightly iridescent. Fore wings slightly and partly tinged with brown; two brown partly black-bordered spots on the costa, one near the base, the other before the middle; interior and exterior lines pale cinereous, denticulated, bent, accompanied by some minute black marks; submarginal line more indistinct; marginal points black. Hind wings cinereous, semihyaline. Length of the body 3 lines; of the wings 8 lines.

Gen. Ariolica, n. g.

Fœm. Corpus vix robustum. *Proboscis* brevis. *Palpi* graciles, verticem paullo superantes; articulus 3us lanceolatus, 2° brevior. *Antennæ* graciles, glabræ. *Abdomen* alas posticas paullo superans. *Pedes* læves, graciles. *Alæ* anticæ acutæ, costa perparum convexa, margine exteriore perobliquo.

Female. Body hardly stout. Proboscis short. Palpi slender, erect, rising a little higher than the vertex; 3rd joint lanceolate, shorter than the 2nd. Antennæ slender, smooth. Abdomen extending a little beyond the hind wings. Legs smooth, slender; hind tibiæ with four long spurs. Wings moderately broad. Fore wings acute; costa very slightly convex; exterior border slightly convex, very oblique.

Allied to *Xanthodes*.

284. Ariolica lineolata, n. s. *Fœm.* Flava, subtus alba, abdomine subaurato, alis anticis albo bilineatis, linea 1^{a} subrecta, 2^{a} undulata, reniformi e annulo elongato albo, alis posticis albis margine exteriore subaurato.

Female. Yellow, white beneath. Abdomen white, slightly gilded. Fore wings with two slender white lines; interior line nearly straight; exterior line undulating, curved outward; reniform mark represented by a transverse elongated white ringlet. Hind wings white, slightly gilded along the exterior border. Length of the body 5 lines; of the wings 14 lines.

285. ARIOLICA? SIGNATA, n. s. *Mas.* Cervina, robusta, palpis subarcuatis, antennis pubescentibus, alis anticis subacutis, puncto discali nigro, lineis duabus ferrugineis, 1ª undulata, 2ª recta obliqua, spatio exteriore cupreo-fusco lineam nigram angulosam includente, plaga costali ferruginea lituram cineream nigro marginatam includente.

Male. Fawn-colour, robust, mostly cinereous beneath. Palpi slightly curved. Antennæ distinctly pubescent. Fore wings slightly acute; costa and exterior border hardly convex; discal point black; interior and exterior lines ferruginous; the former undulating; the latter straight, oblique, more strongly marked; space beyond cupreous brown, including an indistinct black zigzag line; a ferruginous patch along the apical part of the costa, including a cinereous black-bordered costal mark. Length of the body 4? lines; of the wings 10 lines.

Gen. EULEPA, n. g.

Mas. Corpus sat robustum. *Proboscis* conspicua. *Palpi* ascendentes, verticem non superantes; articulus 3ᵘˢ brevis. *Antennæ* vix pubescentes. *Abdomen* alas posticas non superans; fasciculus apicalis parvus. *Pedes* sat validi; tibiæ posticæ calcaribus quatuor longis. *Alæ* anticæ apice vix rotundatæ, costa recta, margine exteriore subconvexo.

Male. Body moderately stout. Proboscis distinct. Palpi ascending, moderately stout, not rising higher than the vertex; 3rd joint elongate-conical, about one-fourth of the length of the 2nd. Antennæ hardly pubescent. Abdomen not extending beyond the hind wings; apical tuft small. Legs moderately stout; hind tibiæ with four long spurs. Wings moderately broad. Fore wings hardly rounded at the tips; costa straight; exterior border slightly convex, moderately oblique.

286. EULEPA NIVEIGUTTA, n. s. *Mas.* Ochraceo-fusca, alis anticis lituris pallidioribus necnon maculis punctisque albis, lunulis marginalibus nigris, punctis marginalibus albis, alis posticis cupreo-fuscis fimbria cinerea.

Male. Ochraceous brown, mostly cinereous beneath. Abdomen cinereous. Fore wings with some paler marks and with several white spots and points, most of which form two irregular bands; one spot apical; marginal lunules black, separated by white points which extend to the fringe. Hind wings cupreous brown; fringe cinereous. Length of the body 4½-5 lines; of the wings 11–12 lines.

Gen. DAPHA, n. g.

Fœm. Corpus robustum, lævc, squamosum. *Proboscis* brevis, gracilis. *Palpi* porrecti, compressi, caput superantes; articulus 2ᵘˢ supra convexus; 3ᵘˢ lanceolatus, 2ⁱ dimidio non brevior. *Antennæ* glabræ, graciles. *Abdomen* alas posticas paullo superans. *Pedes* breves, graciles, calcaribus longis. *Alæ* anticæ acutæ, costa vix convexa, margine exteriore subflexo.

Female. Body stout, smooth, squamous. Frontal tuft prominent. Proboscis short, slender. Palpi porrect, compressed, extending rather far beyond the head; 2nd joint convex above; 3rd lanceolate, about half the length of the 2nd. Antennæ smooth, slender. Abdomen tapering, extending a little beyond the hind wings. Legs smooth, slender; spurs long. Wings moderately broad. Fore wings acute; costa hardly convex; exterior border indistinctly bent, slightly oblique hindward.

287. Dapha exhibens, n. s. *Fœm.* Alba, vix testaceo suffusa, alis anticis iridescentibus fusco nigroque conspersis, lineis duabus ochraceis denticulatis obliquis, 1ª incompleta, 2ª integra extus albido marginata apud costam retracta, spatio marginali purpurascente, punctis marginalibus albis, fimbria fusca, alis posticis purpureo-cinereis basi albo-cinereis.

Female. Whitish, with a very slight testaceous tinge. Fore wings iridescent, irregularly brown- and black-speckled, with two ochraceous oblique denticulated lines; 1st line very incomplete; 2nd line entire, whitish-bordered on the outer side, abruptly retracted in front; exterior space mostly with a purplish tinge; marginal points white; fringe brown. Hind wings purplish cinereous, whitish cinereous towards the base. Length of the body 4 lines; of the wings 9 lines.

Gen. Flammona, n. g.

Corpus vix robustum. *Proboscis* gracilis. *Palpi* obliqui, vix validi, verticem non superantes; articulus 3ᵘˢ minimus. *Antennæ* validæ, glabræ, vix compressæ. *Pedes* læves; tibiæ posticæ subdilatatæ, quadricalcaratæ. *Alæ* anticæ elongatæ, apice rotundatæ, costa recta, margine exteriore subconvexo perobliquo.

Body hardly stout. Frontal tuft flat, prominent. Proboscis slender. Palpi hardly stout, obliquely ascending, not rising higher than the vertex; 3rd joint extremely minute. Antennæ stout, smooth, very slightly compressed. Legs smooth; hind tibiæ slightly dilated, with four moderately long spurs. Wings elongate, moderately broad. Fore wings rounded at the tips; costa straight; exterior border slightly convex, very oblique.

288. Flammona quadrifasciata, n. s. Schistaceo-cinerea, alis anticis fasciis quatuor nigris obliquis subparallelis, 3ª 4ªque intus albo marginatis, striga discali tenui nigra, alis posticis albidis basi cupreo-rufescentibus.

Slaty cinereous, paler beneath. Abdomen pale cinereous. Fore wings with four oblique nearly parallel black bands; 1st and 2nd bands slightly diverging from each other hindward; 3rd and 4th white-bordered on the inner side; 3rd narrower than the 2nd, broader than the 4th; a slender black discal streak between the 2nd and 3rd bands. Hind

wings whitish, cupreous reddish towards the base. Length of the body 4? lines; of the wings 11 lines.

Gen. Dimirica, n. g.

Mas. *Corpus* sat robustum. *Proboscis* distincta. *Palpi* erecti, vix lati, verticem paullo superantes; articulus 3us linearis, 2° paullo brevior. *Antennæ* pubescentes. *Abdomen* alas posticas non superans; fasciculus apicalis parvus. *Pedes* validi, pilosi; tibiæ posticæ calcaribus quatuor longissimis. *Alæ* anticæ amplæ, apice subrotundatæ, costa recta, margine exteriore convexo.

Male. Body moderately stout. Proboscis distinct. Palpi erect, hardly broad, rising a little higher than the vertex; 3rd joint linear, rounded at the tip, a little shorter than the 2nd. Antennæ distinctly pubescent. Abdomen not extending beyond the hind wings; apical tuft small. Legs stout, pilose; hind tibiæ with four very long spurs. Wings ample. Fore wings slightly rounded at the tips; costa straight; exterior border convex, rather oblique.

289. Dimirica nubifera, n. s. *Mas.* Albida, subtus fusca, palpis extus ferrugineis, abdomine fusco iridescente, alis anticis cyaneo purpureoque suffusis, plagis duabus costalibus lineisque tribus denticulatis undulatis nigricantibus, fimbria nigricante albido strigata, alis posticis fuscis.

Male. Whitish, brown beneath. Palpi ferruginous on the outer side. Thorax ferruginous in front. Abdomen iridescent brown. Fore wings mostly suffused with metallic blue and purplish tints; costa with two blackish patches; one at the base, accompanied by some blackish points; three denticulated undulating blackish lines; fringe blackish, with whitish streaks. Hind wings brown. Length of the body 5 lines; of the wings 14 lines.

Gen. Penza, n. g.

Mas. *Corpus* robustum. *Proboscis* valida. *Palpi* subascendentes, caput paullo superantes; articulus 3us brevissimus. *Antennæ* subpectinatæ, breviusculæ. *Abdomen* alas posticas vix superans. *Alæ* anticæ acutæ, costa recta, margine exteriore convexo.

Male. Body stout. Proboscis robust. Palpi slightly ascending, extending a little beyond the head; 3rd joint extremely short. Antennæ slightly pectinated, rather short and stout. Abdomen hardly extending beyond the hind wings. Wings moderately broad. Fore wings acute; costa straight; exterior border convex, moderately oblique.

This genus and the following one should perhaps be removed from the *Acontidæ*; but their affinities are doubtful.

290. Penza puncticeps, n. s. *Mas.* Ferrugineo-fusca, abdomine cinereo, alis anticis cinereo suffusis, lineis cinereis angulosis valde in-

distinctis, nota reniformi magna cinerea rufescente marginata, punctis tribus costalibus albidis. alis posticis cinereo-fuscis subtus bilineatis.

Male. Ferruginous brown, cinereous brown beneath. Basal joint of the antennæ pale at the tip. Abdomen cinereous. Fore wings suffused with cinereous gloss; transverse lines cinereous, zigzag, very indistinct; reniform mark large, cinereous, much contracted in front, bordered with ferruginous red; costa with three whitish points towards the tip. Hind wings cinereous brown, with two darker lines on the underside. Length of the body 4 lines; of the wings 10 lines.

Gen. Choluata, n. g.

Mas. Corpus crassum. *Proboscis* conspicua. *Palpi* robusti, obliqui, verticem non superantes; articulus 3us brevis. *Antennæ* subpectinatæ, apices versus simplices. *Abdomen* cristatum, alas posticas paullo superans. *Pedes* robusti, pilosi; tarsi spinosi. *Alæ* latiusculæ, anticæ apice rectangulatæ, costa subconvexa, margine exteriore vix convexo.

Male. Body very robust. Proboscis distinct. Palpi stout, obliquely ascending, not rising so high as the vertex; 3rd joint elongate-conical, about one-fourth of the length of the 2nd. Antennæ very slightly pectinated to two-thirds of the length. Abdomen crested, extending a little beyond the hind wings. Legs robust, pilose; spurs stout, moderately long; tarsi spinose. Wings rather broad. Fore wings rectangular at the tips; costa almost straight; exterior border hardly convex, oblique hindward.

291. Choluata eburneifera, n. s. *Mas.* Obscure ferrugineo-fusca, abdomine cinereo cristis ferrugineo-fuscis, alis anticis fasciis duabus eburneis non obliquis, 2^{a} interrupta, fascia exteriore dentata ferruginea, lunulis marginalibus nigris, puncto discali albo, alis posticis basi pallide cinereis subtus albido conspersis.

Male. Dark ferruginous brown, somewhat paler and partly cinereous beneath. Abdomen cinereous, with ferruginous brown crests. Fore wings with two irregular upright ivory-white bands; 2nd band interrupted, more irregular than the 1st, contiguous on the outer side to a dentate ferruginous band; a white discal point; marginal lunules black. Hind wings ferruginous, pale cinereous towards the base; underside with minute whitish speckles; discal spot and zigzag exterior line ferruginous. Length of the body 6 lines; of the wings 14 lines.

Gen. Autoba, n. g.

Mas. Corpus robustum, læve, squamosum. *Proboscis* conspicua. *Palpi* ascendentes, læves, sat graciles; articulus 2us arcuatus; 3us parvus, lanceolatus. *Antennæ* pubescentes. *Abdomen* alas posticas vix superans. *Pedes* robusti, brevissimi; calcaria longissima; tarsi latissimi. *Alæ* anticæ amplæ, apice rectangulatæ, costa recta, margine exteriore postico convexo.

Male. Body robust, smooth, squamous. Proboscis distinct. Palpi ascending, smooth, rather slender; 2nd joint curved; 3rd minute, lanceolate, less than one-fourth of the length of the 2nd. Antennæ distinctly pubescent. Abdomen hardly extending beyond the hind wings. Legs stout, very short; tarsi very broad; hind tibiæ with four very long spurs. Wings ample; fringe long. Fore wings acutely rectangular at the tips; costa straight; exterior border convex and oblique hindward.

292. Autoba versicolor, n. s. *Mas.* Cinerea, nigro conspersa, subtus lutescens, capite thoraceque antico fuscis, abdominis basi rufescente, alis fascia fusca obliqua intus diffusa, lineis tribus denticulatis, alis anticis costa rosea nigro bistrigata, alis posticis fimbria saturate rufa.

Male. Cinereous, black-speckled, pale luteous beneath. Head and fore border of the thorax brown. Thorax with a rosy tinge adjoining the brown part. Abdomen reddish towards the base. Wings with a brown band, which is concise on the outer side and diffuse on the inner side, and extends from the tips of the fore wings to half the length of the interior border of the hind wings; interior, exterior, and submarginal lines black, slight, denticulated. Fore wings with a rosy tinge along the costa, which has two exterior oblique black streaks and three more exterior pale points. Hind wings with a deep-red fringe. Length of the body 5 lines; of the wings 12 lines.

Fam. ERASTRIDÆ, *Guén.*

Gen. Erastria, *Ochs.*

293. Erastria securifera, n. s. *Mas.* Albida, gracilis, thorace fusco, humeris albis, abdomine longo, alis anticis fuscis, vitta subcostali strigaque obliqua lineaque submarginali albis, alis posticis cinereis.

Male. Whitish, slender. Antennæ very minutely pubescent. Thorax brown; shoulders white. Abdomen long, extending beyond the hind wings. Fore wings brown, with a subcostal white stripe, which is abbreviated by an oblique white streak; the two somewhat hatchet-shaped; a white submarginal line, attenuated in front. Hind wings cinereous. Length of the body 3½ lines; of the wings 7 lines.

Fam. ANTHOPHILIDÆ, *Dup.*

Gen. Micra, *Guén.*

294. Micra derogata, var. *Mas.* Alba, alis anticis fascia exteriore obliqua latissima purpurea fuscescente marginata strigam albam extus nigro marginatam includente, fimbria fuscescente albo interlineata, alis posticis margine exteriore fuscescente.

Male. White. Third joint of the palpi lanceolate, less than half the

length of the 2nd. Antennæ minutely pubescent. Fore wings with an oblique exterior very broad purple band which is bordered with brownish on both sides, and contains an oblique white streak which is bordered with black on the outer side; fringe brownish, interlined with white. Hind wings brownish along the exterior border. Length of the body 3 lines; of the wings 7 lines.

Inhabits also Ceylon. It may be distinguished from the Australian *M. derogata* by its smaller size and by a very slight difference in the markings.

Gen. Gariga, n. g.

Mas. Corpus sat gracile. *Proboscis* conspicua. *Palpi* porrecti, validi, caput longe superantes; articulus 3us linearis, 2^{i} dimidio non brevior. *Antennæ* glabræ. *Abdomen* alas posticas superans; fasciculus apicalis parvus. *Pedes* læves, validi. *Alæ* anticæ apice rectangulatæ, costa basi subconvexa, margine exteriore postico subobliquo.

Male. Body rather slender. Proboscis distinct. Palpi porrect, stout, extending rather far beyond the head; 3rd joint linear, rounded at the tip, much more slender than the 2nd, and about half its length. Antennæ smooth. Abdomen extending beyond the hind wings; apical tuft small, radiate. Legs smooth, stout; hind tibiæ with one of the apical spurs extremely long. Wings moderately broad. Fore wings acutely rectangular at the tips; costa very slightly convex towards the base; exterior border slightly oblique hindward.

295. Gariga argentilinea, n. s. *Mas.* Viridis, subtus rufescens, abdomine albo punctis ventralibus nigris, alis anticis lineis duabus denticulatis argenteis, lituris apud marginem interiorem nigris, fimbria alba nigro notata basi cervina, alis posticis rufis fimbria albida.

Male. Green, reddish beneath. Abdomen whitish, with two rows of black points beneath. Fore wings with some irregular black marks along the interior border; the largest mark by the interior angle; two silvery upright denticulated lines; fringe double, fawn-colour towards the base, alternately black and white exteriorly. Hind wings red; fringe whitish. Length of the body 4 lines; of the wings 8 lines.

Gen. Chorsia, n. g.

Mas. Corpus robustum, subcylindricum. *Proboscis* conspicua. *Palpi* ascendentes, verticem non superantes; articulus 2us arcuatus, latiusculus; 3us minimus. *Antennæ* subpubescentes. *Abdomen* alas posticas longe superans, fasciculis ventralibus floccosis. *Pedes* longiusculi, sat graciles; tibiæ posticæ calcaribus longissimis. *Alæ* longiusculæ, sat angustæ; anticæ apice rotundatæ, costa recta, margine exteriore subconvexo.

Male. Body stout, nearly cylindrical. Proboscis distinct. Palpi as-

ending, not rising higher than the vertex; 2nd joint curved, rather broad; 3rd somewhat elliptical, very minute, not one-sixth of the length of the 2nd. Antennæ minutely pubescent. Abdomen long, extending much beyond the hind wings; underside with long floccose tufts on each side. Legs rather long and slender; hind tibiæ with four very long spurs. Wings rather long and narrow. Fore wings rounded at the tips; costa straight; exterior border slightly convex, very oblique.

296. Chorsia maculosa, n. s. *Mas.* Albido-cinerea, subtus fuscescens, thorace antico fuscescente, alis anticis plagis tribus costalibus, plaga postica, plaga marginali liturisque fuscis, punctis marginalibus nigris, puncto subtus subapicali albo.

Male. Whitish cinereous, brownish beneath. Thorax brownish in front. Abdomen dingy cinereous. Fore wings with some small slender brown marks, and with three brown costal patches; a hindward brown patch opposite the 2nd costal patch, and another patch on the exterior border; marginal points black; underside with a white subapical point. Length of the body 4 lines; of the wings 10 lines.

Gen. Automala, n. g.

Mas. Corpus sat gracile. *Proboscis* conspicua. *Palpi* porrecti, lati, pilosi, securiformes. *Antennæ* validæ, breviusculæ, setulosæ, pubescentes. *Abdomen* alas posticas superans; fasciculus apicalis parvus. *Pedes* læves, sat graciles. *Alæ* anticæ apice rotundatæ, costa recta, margine exteriore convexo sat obliquo.

Male. Body rather slender. Proboscis distinct. Palpi porrect, broad, pilose, securiform, projecting somewhat beyond the head; joints indistinct. Antennæ stout, setulose, pubescent, rather short. Abdomen long, extending beyond the hind wings; apical tuft small. Legs smooth, rather slender; hind tibiæ with four long spurs. Wings moderately broad. Fore wings rounded at the tips; costa straight; exterior border convex, rather oblique.

297. Automala semidolosa, n. s. *Mas.* Cana, fusco conspersa, abdomine fasciis æneo-cinereis fusco bifasciatis, lineis duabus plagaque costali nigricantibus, alis posticis sordide cinereis.

Male. Hoary, brown-speckled, dingy cinereous beneath. Abdomen with æneous-cinereous bands. Fore wings with two brown irregular bands; one in the middle; the other broader, marginal; interior and exterior lines blackish, the latter much bent; a blackish patch near the base of the costa. Hind wings dingy cinereous. Length of the body 5 lines; of the wings 10 lines.

Gen. Cholimma, n. g.

Fœm. Corpus sat gracile. *Proboscis* robusta. *Palpi* porrecti, caput

superantes; articulus 2us latus, securiformis; 3us indistinctus. *Antennæ* graciles. *Abdomen* alas posticas non superans. *Pedes* læves; tibiæ subfimbriatæ. *Alæ* latiusculæ, breviusculæ; anticæ apice rectangulatæ, costa margineque exteriore rectis.

Female. Body rather slender. Proboscis robust, moderately long. Palpi porrect, extending beyond the head; 2nd joint broad, securiform; 3rd indistinct. Antennæ smooth, slender. Abdomen not extending beyond the hind wings. Legs smooth; tibiæ slightly fringed; hind tibiæ with four long spurs. Wings rather broad and short. Fore wings acutely rectangular at the tips; costa and exterior border straight, the latter hardly oblique.

298. Cholimma leucanioides, n. s. *Fœm.* Pallide straminea, capite thoraceque albis, alis subtus lunula discali fusca, alis anticis fusco subconspersis, punctis duobus discalibus punctisque marginalibus nigris, spatio marginali cervino, alis posticis extus subcervinis.

Female. Pale straw-colour. Head and thorax white. Wings beneath with a brown discal lunule. Fore wings with minute brown speckles, a few of which are confluent and form a brown point in the interior part of the disk; two black exterior discal points, one behind the other; marginal space suffused with fawn-colour; marginal points black. Hind wings somewhat fawn-coloured exteriorly; marginal points only apparent on the fore part of the exterior border. Length of the body 5 lines; of the wings 12 lines.

299. Cholimma subpunctata, n. s. *Fœm.* Flavescenti-testacea, alis anticis lituris nonnullis fuscis albido notatis, punctis marginalibus nigris intus albo marginatis, disco subtus fusco, alis posticis fuscis, fimbria pallida.

Female. Yellowish testaceous. Fore wings with some minute, brown, irregular, more or less whitish-pointed marks; marginal points black, white-bordered on the inner side; disk beneath brown. Hind wings brown; fringe and underside yellowish white. Length of the body 4 lines; of the wings 10 lines.

Gen. Beria, n. g.

Mas. Corpus sat robustum. *Proboscis* obsoleta aut vix conspicua. *Palpi* porrecti, subdecumbentes, caput superantes; articulus 3us lanceolatus, 2° brevior. *Antennæ* validæ, setulosæ, pubescentes; articulus 1us fasciculatus. *Abdomen* alas posticas paullo superans; fasciculus apicalis parvus. *Pedes* validi, læves. *Alæ* sat angustæ; anticæ apice subrotundatæ, costa recta, margine exteriore subconvexo.

Male. Body moderately stout. Proboscis obsolete or nearly so. Palpi porrect, slightly decumbent, extending somewhat beyond the head; 3rd joint lanceolate, shorter than the 2nd. Antennæ stout, setulose, pubescent; 1st joint with a small apical tuft. *Abdomen* extending a

little beyond the hind wings; apical tuft small. Legs stout, smooth; hind tibiæ with four long spurs. Wings rather narrow; fringe long. Fore wings slightly rounded at the tips; costa straight; exterior border slightly convex, very oblique.

300. Beria recusata, n. s. *Mas.* Pallide cervina, abdomine cinereo, alis anticis nigro conspersis, linea marginali nigro extus marginata, linea submarginali venisque albis, fimbria albida fusco interlineata, alis posticis albidis nigro marginatis.

Male. Pale fawn-coloured. Abdomen cinereous. Fore wings with black speckles; veins white; submarginal line white, nearly parallel to the marginal line, which is also white, and is bordered with black on the outer side; fringe whitish, interlined with brown; underside mostly brown. Hind wings whitish, concisely bordered with black; fringe like that of the fore wings. Length of the body 4 lines; of the wings 10 lines.

Gen. Manoba, n. g.

Fœm. Corpus læve, sat robustum. *Proboscis* gracilis. *Palpi* porrecti, lati, pilosi, caput sat superantes; articuli indistincti. *Antennæ* glabræ, breviusculæ, sat validæ. *Abdomen* alas posticas vix superans. *Pedes* læves. *Alæ* anticæ apice subrotundatæ, costa margineque exteriore subconvexis.

Female. Body smooth, moderately stout. Proboscis slender. Palpi porrect, broad, pilose, extending rather beyond the head; joints indistinct. Antennæ smooth, rather stout and short. Abdomen hardly extending beyond the hind wings. Legs smooth; hind tibiæ with four spurs of moderate length. Wings moderately broad. Fore wings slightly rounded at the tips; costa and exterior border slightly convex, the latter rather oblique.

301. Manoba implens, n. s. *Fœm.* Alba, subtus sordide cinerea, alis anticis nigro subconspersis, gutta basali punctisque submarginalibus nigris, lineis duabus fuscis apud costam dilatatis postice approximatis, spatio intermedio postico fuscescente, alis posticis subcinereis.

Female. White, shining. Palpi and underside dingy cinereous. Fore wings very slightly and minutely black-speckled, with a black dot in the disk near the base, and with two brown lines which are dilated on the costa and approach each other hindward, where the space between them is brownish; a few irregular submarginal black points. Hind wings slightly cinereous. Length of the body $3\frac{1}{2}$ lines; of the wings 9 lines.

Gen. Carmara, n. g.

Fœm. Corpus sat robustum. *Proboscis* brevis, gracilis. *Palpi* porrecti, compressi, caput sat superantes; articulus 2us subfusiformis;

3us minimus. *Antennæ* glabræ, graciles. *Abdomen* alas posticas non superans. *Pedes* validi, læves. *Alæ* fimbria longa duplicata; anticæ apice subrotundatæ, costa recta, margine exteriore subconvexo perobliquo.

Female. Body moderately stout. Proboscis short, slender. Palpi porrect, compressed, extending somewhat beyond the head; 2nd joint subfusiform; 3rd extremely minute. Antennæ bare, slender. Abdomen not extending beyond the hind wings. Legs stout, smooth; hind tibiæ with four long spurs. Wings moderately broad; fringe long, double. Fore wings slightly rounded at the tips; costa straight; exterior border slightly convex, very oblique.

302. Carmara subcervina, n. s. *Fœm.* Submurino-cervina, alis linea guttulari alba interrupta, punctis marginalibus nigris, alis anticis costa exteriore albido punctata.

Female. Fawn-colour, with a slight tinge of mouse-colour, which is most prevalent on the hind wings and beneath. Wings with an incomplete white guttular line, which is most apparent by the interior border of the hind wings; marginal points black. Fore wings with some whitish points along the exterior part of the costa. Length of the body 4 lines; of the wings 10 lines.

Gen. Enea, n. g.

Mas. Corpus vix robustum. *Proboscis* conspicua. *Palpi* porrecti, brevissimi, gracillimi, caput vix superantes; articulus 3us minimus. *Antennæ* graciles, subpubescentes. *Abdomen* alas posticas paullo superans; fasciculus apicalis longus. *Pedes* graciles, læves. *Alæ* longiusculæ; anticæ peracutæ, costa recta, margine exteriore subconvexo perobliquo.

Male. Body hardly stout. Proboscis distinct. Palpi porrect, very short and slender, hardly extending beyond the head; 3rd joint extremely minute. Antennæ slender, minutely pubescent. Abdomen extending a little beyond the hind wings; apical tuft long. Legs slender, smooth; hind tibiæ with four long spurs. Wings rather long, moderately broad. Fore wings very acute; costa straight; exterior border slightly convex, very oblique.

303. Enea signicosta, n. s. *Mas.* Albida, subtus sordide cinerea fusco varia, alis lunulis marginalibus nigris, alis anticis maculis tribus costalibus trigonis guttaque discali nigris, margine exteriore ex parte subcerviuo.

Male. Whitish, dingy cinereous and varied with brown on the underside. Wings with black marginal lunules. Fore wings with three black triangular costal spots; the third much larger than the other two; a black discal dot; exterior border partly and slightly tinged with fawn colour. Length of the body 4 lines; of the wings 10 lines.

Fam. ERIOPIDÆ, *Guén.*

Gen. Callopistria, *Hübn.*

304. Callopistria ventralis, n. s. *Mas.* Ferruginea, abdomine cinereo vitta ventrali maculari nigra, alis anticis lineis duabus nigris albo marginatis, 1ª brevissima, 2ª integra, striga intermedia discali lanceolata argentea, basi margineque exteriore albidis, alis posticis fuscis.

Male. Ferruginous, pale cinereous beneath. Palpi dark brown. Antennæ setulose, pubescent. Abdomen cinereous, shining, with a macular black stripe beneath. Wings with black marginal lunules. Fore wings with two black white-bordered lines; 1st line only apparent near the costa, with a black streak by its inner side; 2nd line entire; a silvery lanceolate discal streak between the two lines; basal space of the wing whitish, except along the costa; marginal space whitish, largely and diffusedly marked with brown. Hind wings brown. Length of the body 6 lines; of the wings 16 lines.

Gen. Chodda, n. g.

Fœm. Corpus sat robustum. *Proboscis* valida. *Palpi* porrecti, pilosi, subangulati, caput superantes; articulus 3ᵘˢ longiconicus, 2ⁱ dimidio brevior. *Antennæ* glabræ. *Abdomen* alas posticas vix superans. *Pedes* sat validi; tibiæ subfimbriatæ. *Alæ* anticæ apice rectangulatæ, costa recta, margine exteriore subflexo.

Female. Body moderately stout. Proboscis robust. Palpi porrect, pilose, extending beyond the head; 2nd joint oblique; 3rd elongate-conical, less than half the length of the 2nd, with which it forms a slight angle. Antennæ bare. Abdomen hardly extending beyond the hind wings. Legs moderately stout; tibiæ slightly fringed; hind tibiæ with four long spurs. Wings moderately broad. Fore wings rectangular at the tips; costa straight; exterior border slightly bent in the middle, its hind part rather oblique.

Allied to *Callopistria.*

305. Chodda sordidula, n. s. *Fœm.* Cinereo-alba, cervino varia, alis lunulis marginalibus nigris, alis anticis lituris costalibus cervinis nigro tinctis, striga discali lata obliqua fuscescente nigro intersecta, fascia exteriore informi sordide flavescente fusco varia, striga marginali lata obscure fusca, alis posticis apud marginem exteriorem fuscescentibus.

Female. Cinereous white, varied with dull fawn-colour. Wings with black marginal lunules. Fore wings with various fawn-coloured black-tinged marks along the costa; discal mark forming a broad brownish oblique streak, which is partly and transversely intersected by a smaller black oblique streak; an exterior irregular dingy yellowish brown-varied band; a broad streak along the fore part of the exterior border

and the adjoining fringe dark brown. Hind wings diffusedly brown towards the exterior border. Length of the body 6 lines; of the wings 16 lines.

Fam. EURHIPIDÆ, *Guén.*

Gen. Penicillaria, *Guén.*

306. Penicillaria? quadrinotata, n. s. *Mas.* Pallide cervina, palpis subangulatis, antennis subnodosis, abdominis lateribus fasciculatis, pedibus dense fimbriatis, alis anticis fusco substrigatis et subconspersis, maculis duabus costalibus trigonis linea angulata fasciaque diffusa obliqua fuscis, linea exteriore pallida undulata fusco marginata, macula marginali fusca, alis posticis fuscis basi cinereis.

Male. Pale fawn-colour. Palpi obliquely ascending; 3rd joint conical, not more than one-fourth of the length of the 2nd, with which it forms a slight angle. Antennæ simple, forming a slight knot at one-third of the length. Abdomen tufted along each side, not extending beyond the hind wings; apical tuft small. Legs (including the tarsi) densely fringed. Fore wings slightly streaked and speckled with brown; two triangular brown spots on the costa; 1st spot before the middle, accompanied hindward by an angular parallel brown line, behind which there is an incomplete diffuse oblique brown band; 2nd spot subapical; an exterior pale undulating brown-bordered line; a brown spot on the fore part of the exterior border, which is slightly angular; marginal points black, elongated. Hind wings brown, cinereous towards the base. Length of the body 5 lines; of the wings 12 lines.

It hardly agrees with the typical structure of *Penicillaria*, but does not differ sufficiently to form a new genus; and this remark will apply to the eight following species.

Gen. Eutelia, *Hübn.*

307. Eutelia approximata, n. s. *Mas.* Cinerea, antennis dimidio basali serrato pubescente, alis anticis angustis nigro conspersis fusco trilineatis, linea basali nigra, litura reniformi fusca sublunata albo marginata, macula costali subapicali trigona fusca, alis posticis fusces centi-cinereis sublineatis, macula discali subtus nigra.

Male. Cinereous. Palpi ascending a little higher than the vertex; 3rd joint linear, more than half the length of the 2nd, which is marked with black. Antennæ serrated and pubescent to beyond half the length. Tegulæ of the thorax forming a dorsal ridge. Abdomen extending beyond the hind wings. Legs smooth. Fore wings narrow, minutely black-speckled; lines brown, except the basal line, which is black, undulating, and diffusedly brown-bordered; interior line much bent in front, where it is contiguous to the brown sublunate white-bordered reniform mark; exterior line double, undulating, indistinct; submarginal line dentate, incompletely double, adjoining a brown tri-

angular costal spot; marginal points black; exterior border hardly bent, scarcely dentate, very oblique hindward. Hind wings brownish cinereous, with indistinct brown lines; underside with a brown exterior line and with a black discal spot, which is more conspicuous than that of the fore wings. Length of the body 5 lines; of the wings 14 lines.

308. Eutelia dulcilinea, n. s. *Mas.* Cinerea, *E. approximatæ* simillima, alis anticis linea basali non nebulosa, linea interiore nigra minus flexa, linea exteriore obscuriore, linea submarginali minus dentata albo interlineata.

Male. Cinereous, very closely allied to the preceding species, from which it may be distinguished by the following characters. Fore wings with the basal line not shaded; interior line black, less bent; reniform mark elliptical, not lunate; exterior line much darker; submarginal line interlined with white, much less dentate. Hind wings like those of *E. approximata*, with brown marks near the end of the interior border and with brown marginal lunules. Length of the body $5\frac{1}{2}$ lines; of the wings 13 lines.

309. Eutelia dimidiata, n. s. *Fœm.* Cinereo-cervina, alis anticis fusco lineatis, puncto basali nigro, linea interiore duplicata ex parte nigricante, linea media antice angulata et nigricante, linea exteriore duplicata undulata, linea submarginali pallide cinerea dentata nigro notata, macula costali trigona cervina, litura reniformi nigricante oblonga pallido marginata.

Female. Cinereous fawn-colour, more cinereous beneath. Third joint of the palpi lanceolate, hardly shorter than the 2nd. Abdomen extending a little beyond the hind wings. Wings with the exterior border hardly dentate. Fore wings with a black basal point; lines brown, indistinct; interior line double, partly blackish; middle line blackish, and angular in front; exterior line double, undulating; submarginal line pale cinereous, dentate, accompanied by some black marks, contiguous to a triangular costal fawn-coloured spot; reniform mark blackish, oblong, pale-bordered, attenuated in front; marginal points black. Length of the body $5\frac{1}{2}$ lines; of the wings 13 lines.

310. Eutelia obliquata, n. s. *Fœm.* Pallide cervina, alis anticis nigro subconspersis, plaga basali postica obscuriore, striga basali lineisque nigris, linea basali obliqua abbreviata, lineis exteriore et submarginali denticulatis incompletis, litura reniformi albida magna, macula apicali cana, alis posticis fuscescentibus basi albidis.

Female. Pale fawn-colour, cinereous beneath. Third joint of the palpi lanceolate, less than half the length of the 2nd. Abdomen black-speckled, extending beyond the hind wings. Wings with the exterior border slightly dentate. Fore wings thinly black-speckled, somewhat rounded at the tips, with a darker fawn-coloured patch near the base of the interior border; lines black; basal line oblique, much abbre-

viated at each end; a short oblique costal streak near the base; exterior and submarginal lines denticulated, very incomplete; reniform mark whitish, large; a hoary apical spot; marginal lunules black; exterior border extremely oblique hindward. Hind wings brownish, whitish towards the base. Length of the body 6 lines; of the wings 13 lines.

311. Eutelia opposita, n. s. *Fœm.* Cervina, femoribus tibiisque posticis dense pilosis, alis anticis nigro subconspersis fuseo lituratis, linea obliqua recta, litura reniformi angusta albido marginata nigro unipunctata, spatio exteriore cinereo, macula costali trigona cervina, lineis nonnullis denticulatis fuscis, gutta discali interiore nigricante, alis posticis fuscis vix lineatis.

Female. Fawn-colour, mostly cinereous beneath. Third joint of the palpi linear, about half the length of the 2nd. Hind femora and hind tibiæ densely pilose. Wings rather broad, hardly dentate. Fore wings thinly black-speckled, with brown markings; a straight oblique line contiguous to the narrow whitish-bordered reniform mark, which contains a black dot; space beyond this line cinereous, excepting a large triangular fawn-coloured costal spot; several more or less distinct denticulated brown lines; a blackish dot on the interior part of the disk; marginal lunules black; exterior border extremely oblique hindward. Hind wings brown, with some traces of lines, which are most distinct on the 4th inferior vein. Length of the body 7 lines; of the wings 15 lines.

312. Eutelia subocellata, n. s. *Fœm.* Cinerea, vertice rufescente, abdominis lateribus fasciculatis, alis anticis lituris nigris et cervinis, fascia recta obliqua testacea interlineata ochraceo marginata, ocello informi strigam nigram emittente, linea exteriore brevi nigra, macula costali subtrigona cervina, alis posticis fuscis lineis duabus obscurioribus.

Female. Cinereous, vertex reddish. Palpi ascending higher than the vertex; 3rd joint linear, shorter than the 2nd. Abdomen extending somewhat beyond the hind wings, with two tufts on each side towards the tip, which is quadrate. Wings with the exterior border slightly dentate. Fore wings with a few small irregular black and fawn-coloured marks, and with a straight oblique testaceous band, which is interlined and bordered with ochraceous and is excavated by a large irregular ocellus; the latter. is cinereous, black and fawn-coloured, and emits a black streak to the hind end of a short upright black line; this line is contiguous to a large nearly triangular fawn-coloured costal spot which contains three white costal points; marginal points black; tips rectangular; exterior border slightly bent, extremely oblique hindward; underside with a red diffuse subcostal streak and with three oblique brown lines. Hind wings brown above, with five darker brown lines, which are most distinct on the underside, where there is

a blackish discal spot. Length of the body 8 lines; of the wings 17 lines.

313. Eutelia? consentanea, n. s. *Fœm.* Cinerea, femoribus tibiisque dense pilosis, alis anticis striga basali cervina, fascia obliqua cervina abbreviata, litura reniformi incompleta albido notata, linea exteriore cana subundulata vix obliqua fusco marginata, linea submarginali pallida vix conspicua, alis posticis fuscis, gutta subtus discali nigricante.

Female. Cinereous. Thorax cinereous fawn-colour. Palpi obliquely ascending, hardly rising higher than the vertex; 2nd joint pilose; 3rd linear, less than half the length of the 2nd. Abdomen extending a little beyond the hind wings. Femora and tibiæ densely clothed with long hairs. Wings broad; marginal points black; exterior border slightly dentate. Fore wings rectangular at the tips, with a fawn-coloured streak proceeding from the base, and with an oblique fawn-coloured band, which is abbreviated by the whitish-marked incomplete reniform spot; a hoary brown-bordered slightly undulating hardly oblique exterior line; submarginal line paler than the ground-hue, very indistinct; exterior border hardly bent, very oblique hindward. Hind wings brown; underside with a blackish discal dot and with an exterior denticulated very distinct dark brown line. Length of the body 6 lines; of the wings 14 lines.

314. Eutelia instructa, n. s. *Mas.* Alba, capite rufo nigro conspersо, abdomine alas posticas superante cristis tribus rufis nigro conspersis, alis anticis pallide ochraceis, lineis exterioribus obscurioribus undulatis approximatis parallelis, fasciis duabus obliquis albis, 1ª lituram retiformem emittente, spatio marginali pallide cervino maculas duas nigro-cinereas includente, alis posticis fascia exteriore lata informi fusca.

Male. White. Head red, black-speckled. Palpi ascending as high as the vertex; 3rd joint subfusiform, a little shorter than the 2nd. Antennæ pubescent, and slightly pectinated to much beyond half the length. Abdomen extending far beyond the hind wings, with three red black-speckled hindward crests. Legs short, thick; tibiæ reddish brown, speckled with black and white. Wings long; exterior border slightly dentate. Fore wings pale ochraceous, with some darker undulating approximate parallel exterior lines; two oblique very irregular white bands; 1st band emitting to the white costa from its inner side a net-shaped white mark; 2nd band very incomplete, accompanied by an irregular line formed of black speckles; marginal space pale fawn-colour, with two blackish-cinereous marginal spots; submarginal points black, marked with white; a chalybeous black dot on the interior border. Hind wings with a broad irregular exterior brown band, which is marked with black towards the interior border; marginal space pale fawn-colour, with an incomplete blackish line. Length of the body 9 lines; of the wings 20 lines.

Gen. Varnia, n. g.

Fœm. Corpus crassum. *Proboscis* non conspicua. *Palpi* vix robusti, oblique ascendentes, frontem superantes; articulus 3us lanceolatus, 2i dimidio non longior. *Antennæ* validæ, glabræ. *Abdomen* alas posticas superans; fasciculus apicalis parvus. *Pedes* validi, densissime pilosi. *Alæ* margine exteriore exciso; anticæ acutæ, costa recta.

Female. Body thick. Proboscis not distinct. Palpi hardly stout, obliquely ascending, rising higher than the front; 3rd joint lanceolate, about half the length of the 2nd. Antennæ stout, smooth. Abdomen elongate-conical, extending beyond the hind wings; apical tuft small. Legs stout, most densely clothed with long hairs; spurs long. Wings moderately broad; exterior border deeply and irregularly notched. Fore wings acute; costa straight.

Allied to *Eutelia*.

315. Varnia miniata, n. s. *Fœm.* Læte miniata, subtus cinereofusca, capite thoraceque fuscis, hujus fascia rufa, abdomine vitta fusca guttisque lateralibus flavis, alis strigis transversis fasciisque nigris, alis posticis macula discali magna angulata vitrea.

Female. Bright red-lead colour, mostly cinereous brown beneath. Head and thorax brown, the latter with a red band. Abdomen with a brown stripe and with two rows of yellow dots. Legs reddish brown; hind tibiæ densely tufted along the whole length; the hairs rosy and very long, shorter and brownish towards the tips. Wings with irregular black bands and transverse streaks. Hind wings with a large angular vitreous discal spot. Length of the body 8 lines; of the wings 15 lines.

Fam. PLUSIDÆ, *Boisd.*

Gen. Plusia, *Ochs.*

316. Plusia verticillata, *Guén. Noct.* ii. 344. 68.

Inhabits also South Africa, Hindostan, Ceylon, China, Java, and Australia.

The following ten species do not represent the typical forms of *Plusia*, and some of them may be considered as sufficiently distinct to form new genera.

317. Plusia ferripunctum, n. s. *Mas.* Flava, ochraceo varia, alis anticis ochraceo confertim conspersis, fasciis duabus obliquis argenteis, 1a lata punctum ferrugineum includente costam versus abbreviata, 2a maculari submarginali, alis posticis rufescentibus, subtus albis rufescente quadrilineatis, fasciculo discali interiore floccoso.

Male. Yellow, varied with ochraceous. Frontal tuft prominent. Antennæ pubescent. Abdomen pale. Fore wings thickly speckled with dull ochraceous, the speckles here and there confluent; two irregular oblique silvery bands; 1st band broad, much abbreviated towards the

costa, where it contains a ferruginous point; 2nd band macular, submarginal; exterior border with an ochraceous festoon; underside mostly reddish, with brown submarginal points. Hind wings reddish; underside white, with four reddish lines and with an interior floccose discal tuft. Length of the body 6 lines; of the wings 14 lines.

318. Plusia stipata, n. s. *Fœm.* Cinerea, palpis nigricantibus, abdomine subcristato, alis anticis ex atomis nigris undulato-lineatis, lineis tribus albidis, 1ª 3ªque costam versus retractis, 3ª duplicata postice obsoleta, lunulis marginalibus nigris intus albo marginatis, macula costali basali alba, alis posticis fuscescenti-cinereis subhyalinis fusco late marginatis.

Female. Cinereous. Palpi compressed, obliquely ascending, mostly blackish; 3rd joint lanceolate, less than half the length of the 2nd. Abdomen very slightly crested. Fore wings with some irregular transverse more or less undulating lines of black speckles; three irregular whitish shining lines; 1st line acutely retracted towards the costa, where it is approximate to the 2nd line; 3rd line obsolete hindward, irregularly double, acutely angular and very much recurved towards the costa; marginal lunules black, elongated, bordered with white on the inner side; a white costal spot near the base. Hind wings brownish cinereous, very slightly hyaline, with a broad brown border. Length of the body $4\frac{1}{2}$ lines; of the wings 12 lines.

319. Plusia pallida, n. s. *Mas.* Cinerea, palpis fuscis, thorace fascia fusca, abdomine alas posticas superante, alis anticis nigro conspersis purpurascente tinctis, striga obliqua fasciaque lata fuscis, hac strigam albam anticam includente, disco postico cinereo, striga apud marginem interiorem alba obliqua ochraceo notata, lunulis marginalibus nigris intus albo marginatis.

Male. Cinereous. Palpi brown; 3rd joint conical, not more than one-sixth of the length of the 2nd. Antennæ smooth. Abdomen extending beyond the hind wings. Thorax with a brown band and with brown sides. Fore wings black-speckled, purplish-tinged, with a brown streak which is dilated from the middle of the base to the interior border, and with a broad brown band which has a cinereous disk hindward and in front contains a white streak; the latter extends to the exterior border and emits an angular white line to the costa; an oblique white ochraceous-marked streak along the basal part of the interior border; marginal lunules black, bordered with white on the inner side. Wings beneath with a very broad brown border and with a brown discal spot. Length of the body 8 lines; of the wings 17 lines.

320. Plusia duplicilinea, n. s. *Fœm.* Cinerea, capite thoraceque antico ferrugineo-fuscis, alis anticis latiusculis ferrugineo-fuscis, lineis albidis duplicatis, 1ª angulata, 2ª recurrente, 3ª undulata, 4ª simplici

angulosa, lunulis marginalibus fuscis intus albido marginatis, alis posticis fusco-cinereis, litura discali lineaque exteriore fuscis.

Female. Cinereous, shining. Head and fore part of the thorax ferruginous brown. Palpi hardly ascending; 2nd joint broad; 3rd conical, acute, not more than one-sixth of the length of the 2nd. Abdomen not extending beyond the hind wings. Wings rather broad. Fore wings ferruginous brown; lines whitish, double, interior line forming an outward angle; middle line oblique, proceeding from the costa to the disk, where it is single and abruptly recurved, and rejoins the costa alongside of the interior line; exterior line undulating; submarginal line single, zigzag; marginal lunules brown, whitish-bordered on the inner side. Hind wings brownish cinereous, with a brown discal mark and with a brown exterior line, which are most apparent on the underside. Length of the body 6 lines; of the wings 15 lines.

321. Plusia inaperta, n. s. *Fœm.* Fusca, abdomine cinereo alas posticas vix superante, alis anticis cupreo tinctis, lineis tribus nigricantibus undulatis valde indistinctis, spatio marginali pallido, punctis submarginalibus nigris, gutta punctoque discalibus albidis, alis posticis albidis fusco latissime marginatis.

Female. Brown, cinereous beneath. Palpi rising a little higher than the vertex; 3rd joint lanceolate, much shorter than the 2nd. Abdomen cinereous, hardly extending beyond the hind wings. Fore wings tinged with cupreous; three very indistinct undulating blackish lines; 2nd line not apparent hindward; marginal space paler, including black submarginal points; discal mark small, whitish, forming a dot and a point. Hind wings whitish, with a very broad brown border; underside with a brown discal dot. Length of the body 6 lines; of the wings 14 lines.

322. Plusia inornata, n. s. *Fœm.* Cinereo-fusca, abdomine alas posticas non superante, alis anticis vix acutis, lineis cinereis nigrisque denticulatis subobsoletis, costa margineque exteriore perobliquo subconvexis, alis posticis subtus cinereis lunula discali fusca.

Female. Cinereous brown, shining, more cinereous beneath. Palpi rising a little higher than the vertex; 3rd joint lanceolate, about one-third of the length of the 2nd. Abdomen not extending beyond the hind wings. Fore wings hardly acute, with some almost obsolete traces of cinereous and black denticulated lines; costa and exterior border slightly convex, the latter very oblique. Hind wings brownish cinereous; underside cinereous, with a brown discal lunule. Length of the body 5 lines; of the wings 14 lines.

323. Plusia niveiplaga, n. s. *Mas.* Ochraceo-fusca, antennis serratis pubescentibus, abdomine alas posticas non superante, alis anticis apice subrotundatis, macula magna oblonga gutta punctoque discalibus niveis rufescente inclusis, alis posticis cinereo-fuscis.

Male. Ochraceous brown, shining, brownish cinereous beneath. Palpi

not rising so high as the vertex; 3rd joint conical, less than one-fourth of the length of the 2nd. Antennæ stout, serrated, pubescent. Abdomen not extending beyond the hind wings. Fore wings slightly rounded at the tips, with a large oblong bright white discal spot, which is connected in front with a white dot, and has a white point near its inner side; space about the spot mostly red. Hind wings cinereous brown. Length of the body 4 lines; of the wings 12 lines.

324. Plusia detegens, n. s. *Mas.* Rufescenti-cinerea, antennis subsetulosis, femoribus tibiisque fimbriatis, alis anticis latiusculis, striga lata basali fasciisque duabus exterioribus diffusis rufescentibus ex parte nigro marginatis, linea intermedia cinerea undulata fusco marginata, litura reniformi cinerea obliqua nigro et rufescente marginata, alis posticis cinereo-fuscis fimbria testacea.

Male. Dark cinereous, with a reddish tinge. Palpi rising a little higher than the vertex; 2nd joint fringed; 3rd lanceolate, less than half the length of the 2nd. Antennæ stout, very minutely setulose. Femora and tibiæ thickly fringed. Wings rather broad, with black marginal lunules. Fore wings with reddish partly black-bordered marks, which consist of a broad streak proceeding from the base and two exterior diffuse bands; a cinereous intermediate undulating brown-bordered line; reniform mark cinereous, oblique, bordered with black and reddish. Hind wings cinereous brown, with a testaceous fringe. Length of the body 6 lines; of the wings 16 lines.

325. Plusia invicta, n. s. *Fœm.* Cervina, abdomine cinereo alas posticas vix superante, tibiis pilosis, alis anticis acutis, linea exteriore obscuriore recta obliqua, litura reniformi cinerea elongata coarctata, costa margineque exteriore subconvexis, alis posticis cinereo-fuscis.

Female. Fawn-colour, shining, cinereous beneath. Palpi slender, rising a little higher than the vertex; 3rd joint elongate-conical, a little more than one-fourth of the length of the 2nd. Abdomen cinereous, hardly extending beyond the hind wings. Tibiæ pilose. Fore wings acute; lines almost obsolete, except the exterior one, which is straight, oblique, and a little darker than the ground-hue; reniform mark cinereous, elongate, much straitened in the middle; costa and exterior border slightly convex, the latter very oblique. Hind wings cinereous brown. Length of the body 5 lines; of the wings 12 lines.

326. Plusia? albosignata, n. s. *Mas.* Cervina, antennis subsetulosis, alis anticis vix acutis, lineis duabus rectis obliquis parallelis pallidis, linea 3ª exteriore angulosa indistincta, striga discali alba, punctis marginalibus nigris, alis posticis fusco-cinereis.

Male. Fawn-colour, cinereous beneath. Antennæ very minutely setulose. Wings moderately broad. Fore wings hardly acute, with two pale straight oblique parallel dark-bordered lines; 3rd line exterior, zigzag, indistinct, nearly parallel to the others; a short white discal streak adjoining the 2nd line; marginal points black. Hind wings

brownish cinereous, with brown marginal points. Length of the body 5 (?) lines; of the wings 12 lines.

Gen. Canæa, n. g.

Fœm. Corpus robustum. *Proboscis* conspicua. *Palpi* ascendentes. *Antennæ* graciles. *Abdomen* alas posticas non superans. *Pedes* sat graciles; tibiæ subfimbriatæ. *Alæ* amplæ, elongatæ; anticæ acutæ, vix falcatæ, costa recta, margine exteriore perobliquo vix convexo; posticæ angulo interiore producto.

Female. Body stout. Proboscis distinct. Palpi ascending. Antennæ slender. Abdomen not extending beyond the hind wings. Legs rather slender; tibiæ slightly fringed; hind tibiæ with four long spurs. Wings ample, elongate. Fore wings acute, slightly inclining to the falcate form; costa straight; exterior border hardly convex, very oblique hindward. Hind wings with the interior angle prominent.

327. Canæa semitessellata, n. s. *Fœm.* Pallide straminea, alis fusco subtessellatis, fasciis duabus cervinis, alis anticis fasciis connexis, alis posticis fasciis valde interruptis.

Female. Pale straw-colour. Wings incompletely and irregularly tessellated with little transverse brown streaks; two fawn-coloured bands; 2nd band very irregular, partly connected with the 1st band in the fore wings, much interrupted in the hind wings. Length of the body 8 lines; of the wings 20 lines.

Gen. Osca, n. g.

Mas. Corpus robustum. *Proboscis* conspicua. *Palpi* porrecti, breves, graciles, caput perpaullo superantes; articulus 3us longiconicus, 2^{i} triente non longior. *Antennæ* pubescentes. *Abdomen* alas posticas non superans. *Pedes* læves, graciles, calcaribus longis. *Alæ* longæ, sat angustæ; anticæ vix acutæ, costa recta, margine exteriore perobliquo.

Male. Body stout. Proboscis moderately long. Palpi porrect, short, slender, extending very little beyond the head; 3rd joint elongate-conical, about one-third of the length of the 2nd. Antennæ distinctly pubescent. Abdomen not extending beyond the hind wings. Legs smooth, slender; hind tibiæ with four long spurs. Wings long, rather narrow. Fore wings hardly acute; costa straight; exterior border extremely oblique.

This genus has a slight resemblance to some of the *Arctiidæ*.

328. Osca guttulosa, n. s. *Mas.* Alba, capite thoraceque antico cervinis subtus roseis, alis anticis fasciis quatuor obliquis e maculis guttisque fuscis, alis posticis fasciis roseis indeterminatis, alis subtus lituris costalibus nigris.

Male. White. Head and fore part of the thorax dull fawn-colour, rosy

beneath. Fore wings with four oblique irregular bands, which are composed of shining brown spots and dots; veins most rosy on the underside. Hind wings with the bands much more incomplete and mostly rosy. Wings beneath with minute black marks along the costa. Length of the body 5 lines; of the wings 16 lines.

Fam. CALPIDÆ, *Guén.*

Gen. Deva, *Walk.*

329. Deva infundens, n. s. *Mas.* Ochracea, abdomine basi cinereo, tibiis anterioribus rufescentibus, alis anticis aurato-cervinis fusco lineatis, linea 1ª undulata, 2ª lata recta obliqua extus purpurascente marginata, 3ª indistincta incompleta undulata, 4ª recta obliqua, alis posticis fusescenti-cinereis æneo tinctis.

Male. Ochraceous, pale beneath. Palpi long, much compressed, hardly curved; 2nd joint fringed; 3rd acute, about half the length of the 2nd. Antennæ very thickly setulose and pubescent. Abdomen cinereous towards the base. Anterior tibiæ reddish. Fore wings gilded fawn-colour, with brown lines; space about the base of the costa purple-tinged; 1st line undulating, near the base; 2nd broad, straight, oblique, diffusedly bordered with purple on the outer side; 3rd line indistinct, incomplete, undulating; 4th straight, oblique, nearly contiguous to the 2nd on the interior border; apical space purple-tinged; exterior part of the costa with five white points; fringe cinereous, interlined with brown. Hind wings brownish cinereous, with an æneous tinge. Length of the body 5 lines; of the wings 12 lines.

Gen. Arippara, n. g.

Mas et Fœm. Corpus crassum. *Fasciculus* frontalis productus. *Proboscis* distincta. *Palpi* porrecti, rostriformes, lati. *Antennæ* maris setulosæ, pubescentes. *Abdomen* alas posticas non superans. *Pedes* robusti. *Alæ* anticæ vix acutæ, costa recta, margine exteriore vix convexo.

Male and Female. Body thick. Frontal tuft prominent. Proboscis distinct. Palpi porrect, rostriform, broad, slightly acute, not longer than the breadth of the head; joints indistinct. Antennæ stout, setulose and pubescent in the male. Abdomen not extending beyond the hind wings. Legs robust; spurs stout, moderately long. Wings moderately broad. Fore wings hardly acute; costa straight; exterior border hardly convex, moderately oblique.

330. Arippara indicator, n. s. *Mas* et *Fœm.* Obscure cervina, nigro conspersa, alis anticis spatio medio pallidiore, lineis interiore et exteriore adhuc pallidioribus, puncto discali nigro elongato obliquo, alis posticis cinereis fusco conspersis, linea exteriore recta pallide cinerea.

Female. Dull fawn-colour, minutely black-speckled. Fore wings with the middle space slightly paler, and bounded by the still paler interior

and exterior lines; interior line a little more undulating than the exterior line, to which it is much more approximate on the interior border than on the costa; discal point black, oblique, elongated. Hind wings cinereous, brown-speckled, with a straight pale-cinereous exterior line, and with the more exterior space slightly darker. Length of the body 6 lines; of the wings 14 lines.

Male. Paler. Fore wings with a larger discal point. Length of the body 4 lines; of the wings 11 lines.

Gen. Nertobriga, n. g.

Fœm. *Corpus* robustum. *Proboscis* conspicua. *Palpi* graciles, ad frontem applicati, verticem non superantes; articulus 3us lanceolatus, 2^{i} dimidio brevior. *Antennæ* graciles. *Abdomen* cristatum, alas posticas non superans. *Pedes* lævcs, validi; tibiæ posticæ calcaribus quatuor longis. *Alæ* breviusculæ, latiusculæ; anticæ apice rectangulatæ, costa basi subconvexa, margine interiore valde convexo.

Female. Body stout. Proboscis moderately long. Palpi slender, erect, applied to the head, not rising higher than the vertex; 3rd joint lanceolate, less than half the length of the 2nd. Antennæ slender. Abdomen crested, not extending beyond the hind wings. Legs smooth, stout; hind tibiæ with four long spurs. Wings rather short and broad. Fore wings rectangular at the tips; costa very slightly convex towards the base; exterior border oblique hindward; interior border very convex.

331. Nertobriga reversa, n. s. *Fœm*. Fuscescenti-rufa, abdomine cinereo cristis fuscis, alis anticis linea recta obliqua, spatio exteriore cineraseente, macula costali subapicali elongata cinerea albido marginata, linea interiore undulata indistincta, alis posticis æneo-fuscis.

Female. Brownish red, mostly cinereous beneath. Abdomen cinereous, with brown crests. Fore wings with a straight ferruginous line, which extends from the tips to the middle of the interior border; space beyond the line tinged with cinereous; an elongated cinereous whitish-bordered spot near the tip of the costa; an undulating indistinct interior line. Hind wings æneous brown, with a cinereous fringe. Length of the body 5 lines; of the wings 12 lines.

Fam. HYBLÆIDÆ, *Guén*.

Gen. Hyblæa, *Fabr*.

332. Hyblæa tortricoides, *Guén*. *Noct*. ii. 391. 1252.

333. Hyblæa erycinoides, *Walk*. *Cat*. *Lep*. 3rd ser. no. 1792.
Inhabits also Malacca.

Gen. Nolasena, *Walk*.

334. Nolasena gratissima, n. s. *Fœm*. Luteo-viridis, subtus ochra-

cea, abdomine viridi-ochraceo alas posticas superante, alis anticis glauco-viridibus, fasciis duabus obscurioribus vix undulatis albido marginatis, punctis marginalibus nigris albo marginatis, costa ochracea, macula apicali fusca, alis posticis ochraceis basi viridescentibus.

Female. Luteous green, bright ochraceous beneath. Palpi porrect, subfusiform, extending beyond the head; 3rd joint subfusiform, shorter and narrower than the 2nd. Abdomen greenish orange, extending beyond the hind wings. Fore wings glaucous green, with two upright darker green hardly undulating bands, the 1st whitish-bordered on the inner side, the 2nd on the outer side; marginal points black, white-bordered; costa dull ochraceous, with white points towards the tip; a brown apical spot. Hind wings bright ochraceous, greenish towards the base. Length of the body 5 lines; of the wings 12 lines.

335. Nolasena dulcissima, n. s. *Fœm.* Læte viridis, subtus alba, capite lutescente, palpis pedibusque purpurascentibus, abdomine albo apice subtus rufo, alis anticis luteo conspersis et marginatis, lineis duabus flavescentibus subparallelis, guttis marginalibus connexis purpurascentibus rufo marginatis, alis posticis albis roseo marginatis.

Female. Bright green; white beneath. Head with a luteous tinge. Palpi purplish, ascending higher than the vertex; 3rd joint linear, as long as the 2nd. Antennæ slender. Abdomen white, hardly extending beyond the hind wings, red at the tip beneath. Legs mostly purplish. Fore wings mostly luteous along the borders and with luteous speckles in the disk; two upright pale yellowish nearly parallel lines; marginal dots connected, purplish, red-bordered; costa with three elongated whitish points towards the tip. Hind wings white, with a diffuse rosy border. Length of the body 5 lines; of the wings 12 lines.

This and the preceding species might be separated from *Nolasena* and form two new genera.

Fam. GONEPTERIDÆ, *Guén.*

Gen. Cosmophila, *Boisd.*

336. Cosmophila scitipennis, n. s. *Mas.* Ochracea, abdomine alas posticas superante, pedibus posticis albidis fimbriatis, alis anticis fusco lineatis, spatio exteriore subalbido nebulis fuscis, linea 1ª basali, 2ª angulata, 3ª recta obliqua, 4ª angulata postice abbreviata.

Male. Bright ochraceous. Underside, abdomen, and hind wings paler. Palpi erect, rising higher than the vertex; 3rd joint much shorter and more slender than the 2nd. Antennæ very minutely setulose. Abdomen extending beyond the hind wings. Hind legs whitish; femora and tibiæ thickly fringed. Fore wings with brown lines; space beyond the middle partly clouded with brown and tinged with whitish; 1st line basal; 2nd forming an acute outward angle; 3rd straight,

oblique; 4th angular, not extending beyond half the breadth from the costa. Length of the body 7 lines; of the wings 16 lines.

337. Cosmophila fuscifrons, n. s. *Fœm.* Testaceo-flava, nigro conspersa, capite antico palpisque obscure fuscis, alis linea obliqua recta nigricante subduplicata, spatio exteriore cervino puncta nigra includente, alis anticis linea ochracea non obliqua, puncto discali nigro, gutta costali subapicali alba, margine exteriore angulato.

Female. Testaceous yellow, very thinly black-speckled. Head, except the vertex and palpi, dark brown. Palpi erect, rising higher than the vertex; 3rd joint more slender and much shorter than the 2nd. Wings with an oblique straight blackish slightly doubled line; space beyond the line fawn-colour, including an indistinct row of black points. Fore wings with an upright dull ochraceous line; a black discal point near the outer side of the latter; a white costal subapical dot; exterior border distinctly angular. Length of the body 7 lines; of the wings 17 lines.

338. Cosmophila? inconclusa, n. s. Læte ochracea, abdomine cinereo, alis fasciis duabus diffusis schistaceo-cinereis, 2^{a} marginali, punctis marginalibus nigris, alis anticis costa obscure schistaceo-cinerea, margine exteriore vix flexo, alis posticis costæ dimidio basali albo.

Bright orange. Abdomen and underside cinereous. Wings with two dark-slaty cinereous diffuse irregular bands; 2nd band marginal; marginal points black. Fore wings dark-slaty cinereous along the costa; exterior border hardly bent. Hind wings shining white along the basal half of the costa. Length of the body 6 lines; of the wings 16 lines.

Gen. Anomis, *Hübn.*

339. Anomis fulvida, *Guén. Noct.* ii. 397. 1259.

Inhabits also Hindostan and Ceylon.

Var. *Female.* Reddish fawn-colour, cinereous beneath. Abdomen and hind wings brown. Fore wings with the interior and exterior lines brown, zigzag, the latter very much bent; submarginal line cinereous, zigzag, very indistinct; discal point white. Hind wings with a whitish fringe.

Note.—*Gonitis albitibia* seems to be a variety of this species. *G. combinans* and *G. revocans* probably belong to the genus *Anomis*.

Gen. Banisia, n. g.

Fœm. Corpus crassum. *Proboscis* conspicua. *Palpi* ascendentes, verticem non superantes; articulus 3us longiconicus, 2^{i} triente non longior. *Antennæ* glabræ. *Abdomen* lanceolatum, alas posticas non superans. *Pedes* longiusculi; tibiæ posticæ fimbriatæ. *Alæ* latiusculæ; anticæ peracutæ, costa margineque exteriore rectis.

Female. Body thick. Proboscis distinct. Palpi ascending, not rising

higher than the vertex; 3rd joint elongate-conical, not more than one-third of the length of the 2nd. Antennæ smooth. Abdomen lanceolate, not extending beyond the hind wings. Legs rather long; hind tibiæ thickly fringed, with four spurs of moderate length. Wings rather broad. Fore wings very acute; costa and exterior border straight, the latter rather oblique.

Type, *B. fenestrifera*.

Allied to *Gonitis*.

340. Banisia fenestrifera, n. s. *Fœm.* Rufescenti-cervina, alis nigro subtessellatis, alis anticis macula discali vitrea lituraque marginali subapicali nigra, alis posticis fimbria apice alba.

Female. Reddish fawn-colour. Wings irregularly and minutely tessellated with black, the markings much more distinct on the underside than above. Fore wings with a large vitreous discal spot; underside with an irregular black mark on the fore end of the exterior border. Hind wings with a white-tipped fringe. Length of the body 5 lines; of the wings 14 lines.

341. Banisia? tetragonata, n. s. *Mas.* Pallide cervina, vix robusta, abdomine alas posticas superante, alis fusco lineatis et subtessellatis, maculis duabus subhyalinis duabusque nigricantibus discalibus quadratis, alis anticis acutis, margine exteriore postico perobliquo.

Male. Pale fawn-colour, hardly stout. Third joint of the palpi not one-fourth of the length of the 2nd. Antennæ stout. Abdomen extending beyond the hind wings. Wings indistinctly tessellated with brown; six or seven slight hardly undulating brown lines; two small quadrate nearly hyaline discal spots, each accompanied by a quadrate blackish spot. Fore wings acute; exterior border very oblique hindward. Length of the body 5 lines; of the wings 12 lines.

Gen. Rusicada, *Walk.*

342. Rusicada lignigera, n. s. *Mas.* Pallidissime cervina, abdomine alas posticas vix superante, alis anticis apud costam pallidioribus fusco notatis, margine interiore albido, plaga apud angulum interiorem ferruginea cinereo-fusco suffusa guttam pallidam includente, alis posticis æneis basi cinereis.

Male. Wood-colour or very pale fawn-colour. Palpi obliquely ascending; 3rd joint linear, acute, full half the length of the 2nd. Antennæ very minutely pubescent. Abdomen keeled, hardly extending beyond the hind wings. Legs very stout; spurs long. Fore wings paler and with regular brown marks along the costa; space along the interior border irregularly whitish; a ferruginous mark near the base of the interior border and a ferruginous patch by the interior angle, the patch tinged with cinereous brown and containing a pale dot; marginal points black, very minute. Hind wings æneous, cinereous to-

wards the base and along the interior border; fringe hoary, interlined with ferruginous. Length of the body 5 lines; of the wings 14 lines.

343. Rusicada? basiscripta, n. s. *Fœm.* Albido-cinerea, palpis subarcuatis verticem superantibus, abdomine alas posticas vix superante, femoribus tibiisque densissime vestitis, alis latiusculis nigro subconspersis, linea exteriore cervina subduplicata costam versus flexa albo interlineata, alis anticis basi fuscis, lineis duabus obscurioribus albido marginatis, margine exteriore cervino, plaga marginali subapicali alba.

Female. Whitish cinereous. Palpi erect, much compressed, slightly curved, ascending above the vertex; 3rd joint linear, acuminated, much shorter and more slender than the 2nd. Abdomen hardly extending beyond the hind wings; femora and tibiæ most densely clothed. Wings rather broad, very thinly black-speckled; discal point and submarginal points black; an oblique exterior slightly double fawn-coloured line, which in the fore wings forms a rounded angle and is interlined with white towards the costa. Fore wings very acute; base brown, containing two darker-brown whitish-bordered lines; marginal space pale fawn-colour, darker towards the costa, where it contains a white patch; a black apical spot and a black spot on the angle of the exterior border. Length of the body 7 lines; of the wings 16 lines.

This species differs much from the typical structure of *Rusicada*, and may form a new genus.

Fam. TOXOCAMPIDÆ, *Guén.*

Gen. Toxocampa, *Guén.*

344. Toxocampa? decernens, n. s. *Fœm.* Cinereo-cervina, palpis porrectis extus fuscis, alis fusco conspersis et quadrilineatis, alis anticis purpureo subtinctis, spatio submarginali fusco lineam pallide testaceam includente, macula discali nigra magna oblongo-quadrata, alis posticis lineis quatuor fuscescentibus minus determinatis.

Female. Cinereous fawn-colour. Palpi porrect; 2nd joint brown on the outer side; 3rd conical, hardly one-fourth of the length of the 2nd. Wings brown-speckled; marginal points black. Fore wings slightly purple-tinged, with four zigzag brown lines; 4th line partly obliterated by the brown submarginal space, which is intersected by an abbreviated pale testaceous line; a large oblong-quadrate black discal spot; exterior border hardly bent. Hind wings with four less distinct brownish lines. Length of the body 6 lines; of the wings 16 lines.

345. Toxocampa? obliterans, n. s. *Mas.* Cinereo-cervina, palpis fuscis, pedibus dense pilosis, alis fusco conspersis, spatio marginali lato fuscescente, alis anticis litura reniformi lineisque quatuor angulosis fuscis, linea 5ª pallida abbreviata subarcuata, alis posticis lineis duabus rectis indistinctis, margine interiore dense fimbriato.

Male. Cinereous fawn-colour, stout. Palpi brown, excepting the 3rd joint, which is extremely minute. Antennæ setulose, pubescent. Legs stout, thickly pilose. Wings brown-speckled, with a broad brownish marginal space; marginal points black. Fore wings with the reniform mark and four zigzag lines brown, indistinct; 5th line pale, very slightly curved, much abbreviated at each end. Hind wings with two indistinct straight lines; interior border thickly fringed. Length of the body 7 lines; of the wings 17 lines.

346. Toxocampa? nigripalpis, n. s. *Mas.* Pallide cinereo-cervina, fasciculo frontali producto, palpis nigris, abdomine alas posticas superante cristis duabus nigris, alis anticis nigro subconspersis vix falcatis, linea exteriore pallida marginata subundulata, linea submarginali punctulari maculisque duabus posticis nigris, alis posticis fusescenti-cinereis.

Male. Pale cinereous fawn-colour, hardly stout. Frontal tuft porrect, very prominent. Palpi black, obliquely ascending; 3rd joint pale, somewhat truncated, not one-sixth of the length of the 2nd. Antennæ serrated, pubescent. Abdomen attenuated, extending beyond the hind wings, with two small black-tipped crests near the base. Legs smooth. Wings with black marginal lunules. Fore wings thinly black-speckled, slightly lilac-tinged, hardly falcate; exterior line pale, dark-bordered, slightly undulating, nearly upright, contiguous to a black spot on the interior border; a larger black spot near the base of the interior border; submarginal line indicated by black points. Hind wings brownish cinereous, with a straight nearly obsolete brown line, which is black and distinct by the interior angle. Length of the body 7 lines; of the wings 15 lines.

The three preceding species hardly belong to *Toxocampa*, but form a transition from it to the two following genera, in which the characters of *Toxocampa* are still more altered.

Gen. Sarthida, n. g.

Mas. Corpus robustum. *Proboscis* conspicua. *Palpi* ascendentes, subarcuati, verticem vix superantes; articulus 2us latissimus; 3us gracillimus, apice incisus, 2^{i} dimidio brevior. *Antennæ* longæ, subpectinatæ. *Pedes* validi, pilosi; tibiæ posticæ calcaribus quatuor longis. *Alæ* anticæ apice rectangulatæ, costa recta, margine exteriore subobliquo vix convexo.

Male. Body stout. Proboscis distinct. Palpi ascending, slightly curved, hardly rising higher than the vertex; 2nd joint very broad; 3rd very slender, notched near the tip, not half the length of the 2nd. Antennæ long, slightly pectinated; branches pubescent. Legs stout; femora and tibiæ pilose; hind tibiæ with four long spurs. Wings moderately broad. Fore wings rectangular at the tips; costa straight; exterior border hardly convex, slightly oblique.

347. Sarthida signifera, n. s. *Mas.* Pallide cinerea, palpis extus nigris, alis anticis fusco subconspersis lineis duabus diffusis fuscescentibus, 2ª albo punctata, fascia exteriore cervina costam versus obsoleta, lituris orbiculari et reniformi atris, hac magna cinereo strigata.

Male. Pale cinereous. Second joint of the palpi black on the outer side. Fore wings thinly brown-speckled, with two brownish diffuse lines; exterior line bent in front, accompanied by white points, succeeded by a pale fawn-coloured band, which is obsolete towards the costa; orbicular and reniform marks deep black, nearly round; the latter large, including a curved cinereous streak. Length of the body 7 (?) lines; of the wings 18 lines.

Gen. Oroba, n. g.

Mas. Corpus robustum. *Proboscis* conspicua. *Palpi* compressi, verticem longe superantes; articulus 3ᵘˢ acutus, 2° vix brevior. *Antennæ* longiusculæ, subserratæ. *Abdomen* alas posticas superans. *Pedes* longiusculi; femora pilosa; tibiæ posticæ calcaribus quatuor longis. *Alæ* latiusculæ; anticæ apice subrotundatæ, costa recta, margine exteriore subconvexo subobliquo.

Male. Body stout. Proboscis distinct. Palpi erect, long, compressed, ascending much higher than the vertex; 3rd joint acute, nearly as long as the 2nd. Antennæ rather long, very minutely serrated. Abdomen extending beyond the hind wings. Legs rather long; femora pilose; hind tibiæ with four long spurs. Wings rather broad. Fore wings slightly rounded at the tips; costa straight; exterior border slightly convex and oblique.

348. Oroba surrigens, n. s. *Mas.* Cervina, subtus albida, alis macula discali fusca subtus nigra, alis anticis lineis quinque subundulatis subparallelis, alis posticis linea diffusa fasciaque lata marginali fuscis.

Male. Fawn-colour, whitish beneath. Abdomen cinereous fawn-colour. Wings with a discal brown spot, which on the underside is black and and very conspicuous. Fore wings with five brown slightly undulating nearly parallel lines. Hind wings with a diffuse brown line and a broad brown marginal band. Length of the body 8 lines; of the wings 18 lines.

Gen. Dorsippa, n. g.

Mas. Corpus vix robustum. *Proboscis* conspicua. *Palpi* breves, lati, erecti; articulus 3ᵘˢ conicus, minimus. *Antennæ* setulosæ, pubescentes. *Abdomen* alas posticas vix superans. *Pedes* sat validi; tibiæ posteriores dense fimbriatæ, calcaribus quatuor longis. *Alæ* latiusculæ; anticæ apice rectangulatæ, costa recta, margine exteriore subconvexo.

Male. Body hardly stout. Proboscis distinct. Palpi short, broad, vertical; 3rd joint conical, very minute. Antennæ setulose, pubescent. Abdomen hardly extending beyond the hind wings. Legs

moderately long and stout; posterior tibiæ thickly fringed with long hairs; hind tibiæ with four long spurs. Wings rather broad. Fore wings rectangular at the tips; costa straight; exterior border slightly convex and oblique.

349. Dorsippa notabilis, n. s. *Mas.* Cinereo-cervina, alis anticis spatio marginali obscuriore, puncto basali, litura discali clavata, lineola transversa, maculis duabus costalibus punctisque marginalibus nigris.

Male. Cinereous fawn-colour. Fore wings with black marginal points, with a black point in the disk near the base; discal mark black, clavate, followed by a transverse little black line; two black costal spots, the exterior one much larger than the other, and followed by three black costal points; space along the exterior border darker fawn-colour. Length of the body 5 lines; of the wings 12 lines.

Gen. Lacibisa, n. g.

Mas. Corpus crassum. *Proboscis* conspicua. *Palpi* robusti, ascendentes, verticem non superantes; articulus 2_u^s arcuatus, 3us minimus. *Antennæ* subpubescentes. *Abdomen* subcylindricum, alas posticas superans; fasciculus apicalis dense lanuginosus. *Pedes* validi; tibiæ fimbriatæ, calcaribus longissimis. *Alæ* anticæ apice rotundatæ, costa recta, margine exteriore vix convexo.

Male. Body very stout. Proboscis distinct. Palpi stout, ascending, not rising so high as the vertex; 2nd joint curved; 3rd joint extremely minute, less than one-eighth of the length of the 2nd. Antennæ minutely pubescent. Thorax smooth, with large tegulæ. Abdomen nearly cylindrical, extending beyond the hind wings; apical tuft densely lanuginous. Legs stout; tibiæ fringed; hind tibiæ with four very long spurs. Wings moderately broad. Fore wings rounded at the tips; costa straight; exterior border hardly convex, moderately oblique.

350. Lacibisa bifaria, n. s. *Mas.* Cervina, alis anticis fusco subconspersis et quadrilineatis, linea 1^a basali, gutta discali nigra, fascia marginali cinerea intus nigro-fusco marginata, punctis marginalibus nigris pallido marginatis.

Male. Fawn-colour, paler and with a cinereous tinge beneath. Wings slightly brown-speckled. Fore wings with four transverse parallel nearly straight and upright brown lines; 1st line basal; a black discal dot near the exterior side of the 3rd line; marginal space cinereous, dilated in the middle and excavated in front of the interior side, where it is broadly but irregularly bordered with blackish brown; marginal points black, pale-bordered. Length of the body 8 lines; of the wings 17 lines.

Gen. Carteia, n. g.

Fœm. Corpus robustum. *Proboscis* conspicua. *Palpi* validi, vix as-

cendentes, caput paullo superantes; articulus 3us brevissimus. *Antennæ* subsetulosæ. *Abdomen* alas posticas vix superans. *Pedes* læves, sat robusti; tibiæ subfimbriatæ, calcaribus longissimis. *Alæ* latiusculæ; anticæ acutæ, costa margineque exteriore rectis.

Female. Body stout. Proboscis distinct. Palpi hardly ascending, extending a little beyond the head; 2nd joint stout; 3rd conical, not more than one-sixth of the length of the 2nd. Antennæ minutely setulose. Abdomen hardly extending beyond the hind wings. Legs smooth, moderately stout; tibiæ very slightly fringed; hind tibiæ with four long spurs. Wings rather broad. Fore wings acute; costa and exterior border straight, the latter rather oblique.

351. Carteia nebulilinea, n. s. *Fœm.* Cinereo-cervina, alis anticis nigro conspersis, linea interiore fusca subdenticulata, linea exteriore recta obliqua nigricante fusco late marginata, linea submarginali fusca diffusa undulata, punctis marginalibus nigris, alis posticis fusco late marginatis.

Female. Cinereous fawn-colour. Fore wings black-speckled, with a slight denticulated brown interior line, and with a blackish, straight, oblique, more conspicuous exterior line, which is broadly and diffusedly bordered with brown on the outer side; submarginal line brown, diffuse, undulating; marginal points black. Hind wings broadly bordered with brown. Wings beneath with a blackish discal dot and with a blackish guttular exterior line. Length of the body 7 lines; of the wings 16 lines.

Fam. HOMOPTERIDÆ, *Boisd.*

Gen. Homoptera, *Boisd.*

352. Homoptera intractabilis, n. s. *Mas.* Fusca, abdominis punctis dorsalibus ventreque pallide testaceis, alis linea exteriore denticulata et venarum fasciis pallide testaceis, gutta discali nigricante indistincta, alis anticis lituris costalibus testaceis, alis posticis margine exteriore denticulato.

Male. Brown, rather slender, paler beneath. Antennæ very minutely pubescent. Abdomen with pale testaceous dorsal points; underside pale testaceous. Wings with numerous transverse dull pale testaceous bands on the veins; exterior line pale dull testaceous, denticulated; discal dot blackish, indistinct; underside with the pale hue more prevalent. Fore wings with many testaceous marks along the costa. Hind wings with the exterior border denticulated. Length of the body 7 lines; of the wings 18 lines.

353. Homoptera biarmioides, n. s. *Fœm.* Fuscescenti-cinerea, ferrugineo conspersa, alis subdentatis, lineis duabus ferrugineo-fuscis dentatis, linea submarginali diffusa, punctis marginalibus nigris, litura reniformi annulari oblonga.

Female. Brownish cinereous, speckled with ferruginous, paler beneath.

Palpi rising higher than the vertex; 3rd joint lanceolate, shorter than the 2nd. Wings slightly dentate; interior and exterior lines ferruginous brown, dentate; marginal space partly clouded by the diffuse submarginal line; marginal points black. Fore wings acute; reniform mark represented by an oblong ringlet; exterior border very oblique. Length of the body $3\frac{1}{2}$ lines; of the wings 10 lines.

[To be continued.]

On the Japanese Species of *Leiostraca*. By Arthur Adams, F.L.S.

[Read Jan. 15, 1863.]

In the "Annals" for 1861 I described twelve new species of *Leiostraca* from Japan. To these I am now enabled to add many more from the same seas. The Inland Sea, or Seto-Uchi, I found very prolific in species of this genus, as I did also Yobuko and Uraga, at both of which places I obtained a portion of the bottom. From the circumstance of their living in deep water, they are seldom to be observed alive; and, indeed, nearly all the species mentioned in this communication were obtained (with considerable labour), from mud-washings and the sifted produce of the dredge, in a dead state, and often with the markings obscure.

Gen. Leiostraca, *H. & A. Ad.*

A. *Species concolores.*

1. Leiostraca turgidula, *A. Ad. Annals*, 1861.
Hab. Gotto; Tsu-Sima.

2. Leiostraca lanceata, *A. Ad. Annals*, 1861.
Hab. Seto-Uchi; Mino-Sima; Gotto.

3. Leiostraca Leachii, *A. Ad. Annals*, 1861.
Hab. Mino-Sima; Gotto.

4. Leiostraca paxillus, *A. Ad. Annals*, 1861.
Hab. Mino-Sima; Gotto.

5. Leiostraca clara, *A. Ad. Annals*, 1861.
Hab. Gotto; Mino-Sima.

6. Leiostraca labiata, *A. Ad. Annals*, 1861.
Hab. Mino-Sima.

7. Leiostraca nitida, *A. Ad. Annals*, 1861.
Hab. Okosiri; Yobuko.

8. Leiostraca clavella, *A. Ad. Annals*, 1861.
Hab. Sado.

9. Leiostraca Mindorensis, *Ad. & Rve. Zool. Voy. Samarang*, pl. 11. fig. 25.
Hab. Seto-Uchi.

10. Leiostraca Oberon, *A. Ad. Annals*, 1861.
Hab. Yobuko.

11. Leiostraca Ariel, *A. Ad. Annals*, 1861.
Hab. Seto-Uchi (Bingo-Nada).

12. Leiostraca nivea, *A. Ad. Annals*, 1861.
Hab. Tsu-Sima; Gotto; Mino-Sima.

13. Leiostraca pura, *A. Ad. Annals*, 1861.
Hab. Gotto; Tsu-Sima; Seto-Uchi (Akasi and Mososeki).

14. Leiostraca hastata, *A. Ad.*
L. testa recta, subulato-lanceata, albido-lutescente, semiopaca; anfractibus normalibus 9, planis, suturis inconspicuis, anfractu ultimo elongato, in medio tumidulo; apertura oblongo-ovata, antice effusa; labio subincrassato, aurantiaco tincto.
Hab. Gotto, 48 fathoms.
A yellowish white lanceate species with the inner lip tinged with orange.

15. Leiostraca subulina, *A. Ad.*
L. testa recta, subulata, alba, polita, subpellucida; anfractibus normalibus planis, suturis latissime marginatis, anfractu ultimo elongato, antice producto; apertura anguste ovata, postice acuminata, antice dilatata; labro margine subflexuoso.
Hab. Gotto, 48 fathoms.
A smooth, white, subulate species with flat whorls, and with the sutures very broadly marginate.

16. Leiostraca lepida, *A. Ad.*
L. testa recta, in medio turgidula, semiopaca, alba, nitida; anfractibus normalibus 8, convexis, ultimo magno, subventricoso; apertura elongata, antice et postice angusta.
Hab. Seto-Uchi; Yobuko.
A little, bright, neatly-fashioned species, rather tumid in the middle, and with the whorls convex.

17. Leiostraca Miranda, *A. Ad.*
L. testa recta, subulata, lanceata, in medio turgidula, luteo-alba, opaca, solidula; anfractibus normalibus convexiusculis, varicibus irregularibus instructis, anfractu ultimo in medio subventricoso, antice angusto et producto; apertura elongata, antice et postice acuminata.
Hab. Yobuko.
A rather solid, cream-white species, with a few irregular varices on the whorls.

18. Leiostraca metulina, *A. Ad.*

L. testa recta, subulata, in medio tumidula, solidula, lactea, opaca, metiformi; anfractibus normalibus planis, suturis profundis, anfractu ultimo elongato; apertura quadrato-ovata; labio arcuato.

Hab. Seto-Uchi (Akasi).

A neatly-formed, solid, opaque, milk-white species.

19. Leiostraca pistillum, *A. Ad.*

L. testa recta, vix rimata, clavato-subulata, teretiuscula, ad basin tumida, tenui, albida, opaca; anfractibus normalibus planiusculis, suturis impressis, anfractu ultimo ad basin rotundato, gibboso; apertura subquadrata, antice valde dilatata; labro margine flexuoso, in medio producto.

Hab. Seto-Uchi (Harima-Nada).

A pistilliform or club-shaped species, with the base gibbous and the margin of the outer lip flexuous.

20. Leiostraca crystallina, *A. Ad.*

L. testa subulato-ovata, vitrea, pellucida, tenuicula, vertice violaceo tincta; anfractibus normalibus convexiusculis, suturis anguste marginatis, anfractu ultimo amplo, in medio tumidulo; apertura oblonga, antice dilatata.

Hab. Yobuko.

This species is most like *L. tantilla* in form, but is pellucid and vitreous, with the apex tinged violet.

21. Leiostraca pusilla, *A. Ad.*

L. testa parva, subulata, recta, pallide succinea, nitida, pellucida; anfractibus normalibus planis, suturis obsoletis, anfractu ultimo magno, elongato; apertura oblonga, obliqua, angusta, antice producta et dilatata.

Hab. Seto-Uchi (Mososeki).

A small, subulate, transparent, pale amber-coloured species, with an elongate aperture produced in front.

22. Leiostraca pygmæa, *A. Ad.*

L. testa parva, subulata, vitrea, pellucida, in medio tumidula, suturis anguste marginatis; anfractibus normalibus convexiusculis, ultimo magno; apertura elongata, antice producta, postice angusta, labro margine subdilatato.

Hab. Seto-Uchi (Mososeki).

A very small, pellucid species, with the last whorl large, and produced anteriorly.

23. Leiostraca pusio, *A. Ad.*

L. testa subulata, antrorsum subarcuata, gracili, semidiaphana, pallide cornea; anfractibus normalibus convexiusculis, suturis marginatis, anfractu ultimo elongato; apertura acuminato-ovata.

Hab. Yobuko.

A pale horn-coloured, subulate species, slightly bent forwards, and with somewhat convex whorls.

24. Leiostraca exigua, *A. Ad.*

L. testa subulata, recta, utrinque angustata, sordide alba; anfractibus normalibus planulatis, suturis anguste marginatis, anfractu ultimo amplo, in medio turgidulo; apertura elongata, antice et postice angusta.

Hab. Seto-Uchi (Akasi).

A small, dull-white species, with the base narrowed.

25. Leiostraca nana, *A. Ad.*

L. testa ovato-subulata, recta, spira attenuata, alba, nitida, subdiaphana; anfractibus normalibus convexiusculis, suturis marginatis; apertura elongato-ovata, antice effusa et subproducta.

Hab. Yobuko.

Most like *L. tantilla*; but the outline of the spire is concave, the vertex attenuated, and the whorls less convex.

26. Leiostraca pumila, *A. Ad.*

L. testa parva, subulata, gracili, utrinque angustata, alba, opaca; anfractibus normalibus convexiusculis, ultimo in medio tumidulo; apertura angusta, elongata, antice acuminata; labio rectiusculo.

Hab. Uraga.

Belongs to the species with convex whorls, such as *L. tantilla*, but is slender, with a narrow aperture, and straight inner lip.

B. *Species variegatæ.*

27. Leiostraca nixa, *A. Ad. Annals*, 1861.

Hab. Mino-Sima; Gotto.

28. Leiostraca spiculum, *A. Ad. Annals*, 1861.

Hab. Mino-Sima.

29. Leiostraca bilineata, *Ad. & Rve. Zool. Voy. Samarang*, pl. 11. fig. 24. (L. bivittata, *H. & A. Ad.* "*Genera.*")

Hab. Uraga; Seto-Uchi.

30. Leiostraca lentiginosa, *A. Ad. Annals*, 1861.

Hab. O-Sima; Seto-Uchi (Mososeki).

31. Leiostraca picturata, *A. Ad.*

L. testa subulata, crassa, subdiaphana, nitida, lutescente, lineis rufis undulatis longitudinalibus et maculis irregularibus varie picta, vertice violaceo; suturis rufescentibus, marginatis; anfractibus normalibus 8, planis, ultimo antice producto; apertura elongata; labio incrassato, calloso.

Hab. Gotto, 48 fathoms.

A very pretty species, variously marked with lines and spots.

32. Leiostraca conspurcata, *A. Ad.*

L. subulata, recta, teretiuscula, sordide alba, lineis maculisque fuscis irregulariter reticulata; spira attenuata; anfractibus normalibus 6, planis,

suturis obsoletis; apertura elongato-ovata, antice dilatata, postice acuminata.

Hab. Takano-Sima.

A small, subulate species, with irregular fuscous reticulate markings.

33. Leiostraca bizona, *A. Ad.*

L. testa subinflato-subulata, recta, spira attenuata, semiopaca, alba, suturis late marginatis; anfractu ultimo amplo, subventricoso, antice producto-acuminato, ad peripheriam fasciis duabus fuscis ornato; apertura elongata, labio subcalloso.

Hab. Gotto, 48 fathoms.

A banded species, with the spire attenuated and the last whorl somewhat ventricose.

34. Leiostraca circumcincta, *A. Ad.*

L. testa subulata, recta, vitrea, nitida, semipellucida, corneo-lutescente; anfractibus normalibus 6, convexiusculis, in medio linea rufa transversa ornatis, anfractu ultimo ad peripheriam lineis duabus transversis fuscis succincto; apertura elongata, utrinque angustata; labio subcalloso; labro in medio producto.

Hab. Seto-Uchi (Akasi.)

Most like *L. vincta*, but with the rufous line in the middle of the whorls, and the lines on the last whorl parallel.

35. Leiostraca bifascialis, *A. Ad.*

L. testa subulata, recta, fulvescente, rufo nebulosa, basi rufo tincta, fascia rufa diffusa ad suturas ornata; anfractibus normalibus 9, planis, suturis marginatis, anfractu ultimo elongato, fasciis duabus fuscis ad peripheriam succincto; apertura angusta, ovata, antice et postice acuminata; labio rufo tincto, labro in medio subproducto.

Hab. Bingo-Nada; Suwo-Nada.

Near *L. bilineata*, Ad. et Rve., but of stouter build, the base stained with rufous, and the bands broad and nebulous.

36. Leiostraca vincta, *A. Ad.*

L. testa recta, subulata, nitida, semiopaca, sordide alba, linea rufa ad suturas ornata, vertice violaceo; anfractibus normalibus 7, planatis, ultimo ad peripheriam lineis angustis rufis, ad marginem labri approximantibus, ornato; apertura acuminato-ovata, labio rufo tincto.

Hab. Bingo-Nada; Harima-Nada.

The two rufous lines on the last whorl approach each other, and are united at the produced middle of the outer lip.

37. Leiostraca tæniata, *A. Ad.*

L. testa subulata, recta, gracili, cornea, subdiaphana, linea rufa transversa supra suturas ornata; anfractibus normalibus 6, convexiusculis, suturis impressis, anfractu ultimo elongato, lineis duabus rufis transversis cincto; apertura anguste ovata; labio subcalloso; labro margine flexuoso.

Hab. Seto-Uchi (Akasi).

A rather slender, horn-coloured species, with the whorls banded in the middle.

38. Leiostraca balteata, *A. Ad.*

L. testa subulata, tenui, recta, subpellucida, cornea; suturis impressis, anguste marginatis, fuscis; anfractibus normalibus 7, planiusculis, anfractu ultimo elongato, antice producto, lineis rufis transversis in medio succincto; apertura acuminato-ovata; labio subcalloso; labro margine flexuoso.

Hab. Uraga.

A subulate, horn-coloured species, with two bands on the last whorl.

39. Leiostraca gracilenta, *A. Ad.*

L. testa subulata, recta, gracili, cornea, vitrea, semipellucida; anfractibus normalibus 7, planatis, suturis rufo tinctis, anfractu ultimo elongato, producto, in medio lineis duabus fuscis transversis ornato; apertura obliqua, ovato-acuminata; labio rufo, pallide tincto; labro margine subrecto.

Hab. Uraga.

A slender, horn-coloured, transparent, tapering species.

40. Leiostraca cinctella, *A. Ad.*

L. testa ovato-subulata, recta, spira attenuata, lactea, tenuicula; anfractibus normalibus 7, convexiusculus, ultimo amplo, subventricoso, fasciis duabus pallide fulvis transversis ornato; apertura oblongo-ovata, postice acuminata, antice dilatata.

Hab. Seto-Uchi (Mososeki).

Most like *L. tantilla*, but with the spire attenuated and the last whorl more ventricose.

41. Leiostraca cingenda, *A. Ad.*

L. testa tumidulo-subulata, spira attenuata, alba, tenui, subdiaphana, linea rufa transversa in medio anfractuum et lineis duabus in anfractu ultimo ornata, anfractu ultimo magno, antice producto et acuminato; apertura elongata, angusta, labro margine rectiusculo.

Hab. Yobuko.

A thin, semipellucid, banded species, with the last whorl ventricose.

42. Leiostraca interrupta, *A. Ad.*

L. testa subulata, retrorsum inclinata, semidiaphana, alba; anfractibus normalibus 8, planis, suturis marginatis, sublutescentibus, anfractu ultimo linea fulva interrupta ornato; apertura ovata, antice dilatata; labio subcalloso, labro margine in medio subproducto.

Hab. O-Sima.

A white, subulate species, somewhat inclined backwards, and with an interrupted fulvous zone on the last whorl.

43. Leiostraca tantilla, *A. Ad.*

L. testa ovato-subulata, vertice attenuato, alba, interdum fascia pallida

ornata; anfractibus normalibus 6, convexis, ultimo amplo, in medio turgidulo, fasciis duabus obsoletis fuscis sæpe circumcincto; apertura oblongo-ovata, antice producta ac dilatata.

Hab. Seto-Uchi (Akasi, Mososeki).

A somewhat tumid species, resembling in form *L. turgidula*, but smaller and obscurely banded.

44. Leiostraca crassula, *A. Ad.*

L. testa subulato-conica, elongata, crassa, semidiaphana, alba, fascia lata transversa pallide fulva ornata; anfractibus normalibus 7, planis, ultimo magno, subventricoso; apertura oblonga, antice dilatata, postice acuminata.

Hab. O-Sima.

A rather solid, semipellucid species, obscurely banded with fulvous.

45. Leiostraca inquinata, *A. Ad.*

L. testa teretiuscula, subulata, gracili, nitida, albida, fulvo pallide inquinata; anfractibus normalibus circa 6, suturis callosis, obsoletis, anfractu ultimo subdilatato; apertura acuminato-ovata.

Hab. Yobuko.

A small species, with a broad fulvous stain on the whorls.

46. Leiostraca scitula, *A. Ad.*

L. testa subulata, in medio tumidula, spira attenuata, alba, opaca; anfractibus normalibus 6, convexiusculis, suturis marginatis, anfractu ultimo amplo, antice acuminato et producto, in medio vix angulato, linea rufa transversa subobsoleta succincto; apertura elongata, antice et postice angusta.

Hab. Seto-Uchi (Mososeki).

A white species, with the last whorl large and slightly angulate at the periphery.

47. Leiostraca spreta, *A. Ad.*

L. testa parva, ovato-subulata, teretiuscula, alba, semiopaca, fulvo lato indistincto ad suturas ornata; anfractibus normalibus planis, ultimo magno, subventricoso, in medio fascia pallida circumcincto; apertura ovata, antice dilatata, postice acuminata.

Hab. Yobuko.

A small, pointed species, with the whorls obscurely banded.

48. Leiostraca humilis, *A. Ad.*

L. testa parva, subulata, subcompressa, albida, nitida; suturis rufescentibus, marginatis; anfractu ultimo lineis duabus rufis ornato; apertura elongata, antice dilatata, labio rufo tincto.

Hab. Uraga.

A small species, somewhat compressed, and with two transverse rufous lines on the last whorl.

Subgenus Mucronalia, *A. Ad.*

Testa subulata, recta, pupoidea, vertice obtuso, apice subito mucronata; anfractibus simplicibus. *Apertura* oblonga.

1. Mucronalia bicincta, *A. Ad. Annals*, 1860.
Hab. Mino-Sima, 63 fathoms.

2. Mucronalia exilis, *A. Ad. Annals*, 1861.
Hab. Seto-Uchi (Mososeki).

3. Mucronalia lactea, *A. Ad.*
M. testa subulata, pupoidea, vertice obtuso, mucrone parvo brevi, lactea, vix opaca; anfractibus normalibus 4, planis, suturis impressis; apertura obliqua, oblonga, antice dilatata et producta.
Hab. Tanabe.
A milk-white pupoid species, with the aperture very oblique and produced.

4. Mucronalia subula, *A. Ad.*
M. testa subulata, nivea, vix opaca, pupoidea, vertice obtuso, mucrone parvo; anfractibus normalibus 6, planis, suturis impressis; apertura normali, oblongo-ovata.
Hab. Simoda.
Like *M. lactea*, but larger, with more numerous whorls, and the aperture not produced nor oblique as in that species.

Subgenus Selma, *A. Ad.*

Testa oblongo-ovata, tenuis, subdiaphana, spira brevi, anfractu ultimo magno. *Apertura* elongato-ovata, antice integra; labio arcuato, oblique subplicato.

1. Selma succiniola, *A. Ad.*
S. testa elongato-ovali, tenui, rimata, subdiaphana, cornea, rufo tincta, spira brevi; anfractibus $3\frac{1}{2}$, vix convexis, ultimo amplo; apertura oblonga; labio rufo tincto, plica subtortuosa rufa instructo, labro margine simplici.
Hab. O-Sima.
I have been necessarily obliged to keep this species distinct from the others on account of its short spire and the spiral twist on the inner lip. The only specimen I obtained is a little *Succinia*-shaped shell, and, were it not for the aperture being entire in front, might be taken for a very young *Olivella*.

On the Species of Rostriferous Gasteropods (*Strombidæ*, *Trichotropidæ*, *Cyprædæ*, and *Amphiperasidæ*) found in Japan. By Arthur Adams, F.L.S., &c.

[Read January 15, 1863.]

The species of *Strombidæ* collected by me during the recent ex-

ploration of the coasts of Japan by H.M.S. 'Actæon' are all well-known species; in the family *Trichotropidæ* I was fortunate in finding a new *Iphinoë* and a beautifully-sculptured *Trichotropis*, besides nearly all the known species of that group. In the Cowry tribe nearly all the species are old Linnean shells. They are most numerous along the Pacific shores of the Japanese Islands, and more especially along the southern and eastern parts of Kiusu. The coral reefs of the Tropics are badly represented in Japan, and it is among the recesses of these that the Cowries delight to live. One new species only, belonging to the *Amphiperasidæ*, has occurred to me, most of the specimens found having been previously described by Sowerby from examples brought home by Sir E. Belcher and myself in H.M.S. 'Samarang.' The present paper presents a striking contrast to the others I have recently offered to the Society, which were principally composed of new species.

Fam. STROMBIDÆ.

1. Gallinula, *Klein*.

1. Gallinula vittata, *Linn.* (Strombus vittatus, *L. Syst. Nat.* ed. 12. p. 1211; *Rve. Conch. Icon.* sp. 44.—S. turritus, *Lam.*—S. Campbelli, *Gray*.—S. Japonicus, *Rve.*)

Hab. Takano-Sima; Tomo.

2. Gallinula succincta, *Linn.* (Strombus succinctus, *L. Syst. Nat.* ed. 12. p. 1212; *Rve. Conch. Icon.* sp. 43.—S. accinctus, *Born.*)

Hab. Tatiyama; Okino-Sima.

2. Canarium, *Schum.*

1. Canarium Luhuanum, *Linn.* (Strombus Luhuanus, *L. Syst. Nat.* ed. 12. p. 1209; *Rve. Conch. Icon.* sp. 19.)

Hab. Takano-Sima; Tago.

3. Terebellum, *Klein*.

1. Terebellum terebellum, *Linn.* (Bulla terebellum, *L. Syst. Nat.* ed. 12. p. 1185.—Conus terebellum, *Linn.*—Terebellum subulatum, *Lam. Ann. du Mus.* xvi. p. 301. no. 1.)

Hab. Nagasaki, 17 fathoms, mud; Yobuko, 20 fathoms, sandy mud.

Fam. TRICHOTROPIDÆ.

1. Trichotropis, *Brod. & Sow.*

1. Trichotropis bicarinata, *Brod. & Sow. Zool. Journ.* 1829, iv. p. 375. (T. Sowerbiensis, *Lesson.*)

Hab. Aniwa Bay, 17 fathoms; Gulf of Tartary, 29 fathoms.

2. Trichotropis insignis, *Middendorff, Beitr. zu einer Mal. Ross.* ii. p. 108.
Hab. Aniwa Bay, 17 fathoms.

3. Trichotropis borcalis, *Brod. & Sow. Zool. Journ.* 1829, iv. p. 375. (T. costellata, *Couth.*—T. Atlantica, *Beck.*—T. umbilicata, *Macgilliv.*)
Hab. Castle Point, Manchuria, 37 fathoms.

4. Trichotropis conica, *Möll. Ind. Moll. Grœnland.* p. 85.
Hab. Castle Point, Manchuria, 37 fathoms.

5. Trichotropis cancellata, *Hinds, Zool. Voy. Sulph. Moll.* pl. 11. f. 11, 12.
Hab. Satanomosaki, 55 fathoms.

6. Trichotropis inermis, *Hinds, Zool. Voy. Sulph. Moll.* pl. 11. f. 13, 14.
Hab. Okosiri, 35 fathoms.

7. Trichotropis cedo-nulli, *A. Ad. Ann. & Mag. Nat. Hist.* 1860.
Hab. Gotto Islands, 48 fathoms; Mino-Sima, 63 fathoms.

2. Iphinoë, *H. & A. Ad.*

1. Iphinoë unicarinata, *Sow.* (Trichotropis unicarinata, *Sow. Gen. of Shells.*)
Hab. Gotto, 48 fathoms; Uraga, 21 fathoms.

2. Iphinoë quadricarinata, *A. Ad. Ann. & Mag. Nat. Hist.* 1861.
Hab. Okosiri, 35 fathoms.

Fam. CYPRÆIDÆ.

1. Cypræa, *Linn.*

1. Cypræa fimbriata, *Gmel. Syst. Nat.* p. 2423; *Rve. Conch. Icon.* sp. 92.
Hab. Kino-O-Sima.

2. Cypræa felina, *Gray, Zool. Journ.* i. p. 384; *Rve. Conch. Icon.* sp. 105.
Hab. Kino-O-Sima.

3. Cypræa flaveola, *Linn. Syst. Nat.* p. 1179; *Rve. Conch. Icon.* sp. 95.
Hab. Tatiyama; Tsu-Sima; Kino-O-Sima.

2. Aricia, *Gray.*

1. Aricia Arabica, *Linn.* (Cypræa Arabica, *L. Syst. Nat.* ed. 12. p. 1173; *Rve. Conch. Icon.* sp. 2.—C. fragilis, *Linn.*, young.—C. amethystea, *L.*, young.—C. eglantina, *Ducl.*)
Hab. Tago.

2. Aricia reticulata, *Martyn.* (Cypræa reticulata, *Martyn, Univ. Conch.* pl. 15; *Rve. Conch. Icon.* sp. 3.—C. histrio, *Gmel.*—C. arlequina, *Chemn.*)
Hab. Kino-O-Sima.

3. Aricia moneta, *Linn.* (Cypræa moneta, *L. Syst. Nat.* ed. 12. p. 1178; *Rve. Conch. Icon.* sp. 74.)
Hab. Tatiyama; Tanabe.

4. Aricia caput-serpentis, *Linn.* (Cypræa caput-serpentis, *L. Syst. Nat.* ed. 12. p. 1175; *Rve. Conch. Icon.* sp. 44.)
Hab. Tanabe; Kino-O-Sima; Tago; Tsu-Sima.

3. Luponia, *Gray.*

1. Luponia caurica, *Linn.* (Cypræa caurica, *L. Syst. Nat.* ed. 12. p. 1179; *Rve, Conch. Icon.* sp. 46.)
Hab. Satanomosaki, 55 fathoms.

2. Luponia onyx, *Linn.* (Cypræa onyx, *L. Syst. Nat.* ed. 12. p. 1177; *Rve. Conch. Icon.* sp. 39.—C. adusta, *Lam.*)
Hab. Tsusaki; Tanabe; Tatiyama.

3. Luponia helvola, *Linn.* (Cypræa helvola, *L. Syst. Nat.* ed. 12. p. 1180; *Rve. Conch. Icon.* sp. 72.)
Hab. Takano-Sima.

4. Luponia vitellus, *Linn.* (Cypræa vitellus, *L. Syst. Nat.* ed. 12. p. 1176, *Rve. Conch. Icon.* sp. 14.)
Hab. Kino-O-Sima.

5. Luponia clandestina, *Linn.* (Cypræa clandestina, *L. Syst. Nat.* ed. 12. p. 1177; *Rve. Conch. Icon.* sp. 106.)
Hab. Tsu-Sima; Tatiyama; Kino-O-Sima.

6. Luponia erosa, *Linn.* (Cypræa erosa, *L. Syst. Nat.* ed. 12. p. 1179; *Rve. Conch. Icon.* sp. 43.)
Hab. Tanabe; Takano-Sima.

7. Luponia pallida, *Gray.* (Cypræa pallida, *Gray, Zool. Journ.* i. p. 387; *Rve. Conch. Icon.* sp. 54.)
Hab. Japan.
I have not met with this species.

4. Pustularia, *Swains.*

1. Pustularia staphylea, *Linn.* (Cypræa staphylea, *L. Syst. Nat.* ed. 12. p. 1181; *Rve. Conch. Icon.* sp. 82.—C. limacina, *Lam.*, var.)
Hab. Satanomosaki; Tatiyama; Takano-Sima.

5. Trivia, *Gray.*

1. Trivia globosa, *Gray, Sow. Conch. Illust.* Cypræidæ, no. 117; *Rve. Conch. Icon.* sp. 152. (Cypræa pilula, *Kien.*)
Hab. Satanomosaki, 55 fathoms.

2. Trivia grando, *Gask. Proc. Zool. Soc.* 1849, p. 17.
Hab. Gotto, 71 fathoms; Simoda.

Fam. AMPHIPERASIDÆ.

1. Amphiperas, *Gronov.*

1. Amphiperas brevis, *Sow.* (Ovulum breve, *Sow. Thes. Conch.* pl. 101. f. 70, 71.)
Hab. Mino-Sima, 63 fathoms.

2. Amphiperas pyriformis, *Sow.* (Ovulum pyriforme, *Sow. Thes. Conch.* pl. 101. f. 72, 73.)
Hab. Satanomosaki, 55 fathoms.

3. Amphiperas bulla, *Sow.* (Ovulum bulla, *Sow. Thes. Conch.* pl. 101. f. 82, 83; *Moll. Voy. Sam.* pl. 6. f. 5 *a*, *b*.)
Hab. Satanomosaki, 55 fathoms.

4. Amphiperas punctata, *Duclos.* (Ovula punctata, *Ducl.*, *Guér. Mag. de Zool.* 1828.—Ovulum punctatum, *Sow. Thes. Conch.* pl. 101. f. 90, 92.)
Hab. Gotto Islands, 48 fathoms.

5. Amphiperas umbilicata, *Sow.* (Ovulum umbilicatum, *Sow. Thes. Conch.* pl. 101. f. 88, 89.)
Hab. Gotto Islands, 71 fathoms.

6. Amphiperas Rhodia, *A. Ad. Proc. Zool. Soc.* 1854, p. 130.
Hab. Japan, teste *Cuming*.

2. Calpurnus, *Montf.*

1. Calpurnus concinnus, *Sow.* (Ovulum concinnum, *Sow. Moll. Voy. Sam.* pl. 6. f. 8.)
Hab. Mino-Sima, 63 fathoms.

2. Calpurnus lacteus, *Lam.* (Ovula lactea, *Lam. Hist. An. s. Vert.* vii. p. 368.—Ovulum lacteum, *Sow. Thes. Conch.* pl. 101. f. 67, 69.)
Hab. Kino-O-Sima.

3. Calpurnus carneus, *Lam.* (Ovula carnea, *Lam. Hist. An. s. Vert.* vii. p. 368.—Ovulum carneum, *Sow. Thes. Conch.* pl. 101. f. 74–77.)
Hab. Kino-O-Sima.

4. Calpurnus striatulus, *Sow.* (Ovulum striatulum, *Sow. Thes. Conch.* pl. 101. f. 84, 85.)
Hab. Tsusaki, 55 fathoms.

5. Calpurnus bullulatus, *Sow.* (Ovulum bullulatum, *Sow. Moll. Voy. Sam.* pl. 7. f. 13 *a*, *b*.)
Hab. Gotto Islands, 71 fathoms.

6. Calpurnus dentatus, *Sow.* (Ovulum dentatum, *Sow. Moll. Voy. Sam.* pl. 7. f. 4 *a*, *b*.)
Hab. Gotto Islands, 48 fathoms.

7. Calpurnus formosus, *Sow.* (Ovulum formosum, *Sow. Moll. Voy. Sam.* pl. 7. f. 6 *a*, *b*.)
Hab. Kino-O-Sima.

8. Calpurnus dorsuosus, *Hinds.* (Ovulum dorsuosum, *Hinds, Moll. Voy. Sulph.* pl. 17. f. 3, 4.)
Hab. Gotto Islands, 48 fathoms.

3. Cyphoma, *Bolt.*

1. Cyphoma elongatum, *A. Ad.* *C.* testa elongata, angusta, utrinque valde producta, alba, in medio angulata, lævi; canalibus productis, emarginatis; apertura angusta, antice subdilatata; labio lævi, plano, extus callo gibboso instructo, antice intus longitudinaliter sulcato; labro crasso, in medio subangulato, extus varicoso.
Hab. Gotto, 48 fathoms.

The *Cyphoma* group consists of the species of *Ovula*, Lam., named *O. gibbosa*, *O. emarginata*, and *O. intermedia*. The present species is much more elongated and narrower even than *O. intermedia*, but it has the dorsal ridge and other peculiarities which constitute a *Cyphoma*.

4. Volva, *Bolt.*

1. Volva volva, *L.* (Bulla volva, *Linn. Syst. Nat.* ed. 12. p. 1185.—Ovula volva, *Lam.*—Ovulum volva, *Sow. Thes. Conch.* pl. 99. f. 6–8.)
Hab. Satanomosaki, 55 fathoms.

5. Radius, *Schum.*

1. Radius recurvus, *Sow.* (Ovulum recurvum, *Sow. Moll. Voy. Sam.* pl. 7.f. 3 *a*, *b*, *c*.)
Hab. Satanomosaki, 55 fathoms.

2. Radius subreflexus, *Sow.* (Ovulum subreflexum, *Sow. Moll. Voy. Sam.* pl. 7. f. 10 *a*, *b*.)
Hab. Tsu-Sima, 25 fathoms.

3. Radius acuminatus, *Sow.* (Ovulum acuminatum, *Sow. Moll. Voy. Sam.* pl. 7. f. 1 *a*, *b*.)
Hab. Kuro-Sima, 35 fathoms.

4. Radius obtusus, *Sow.* (Ovulum obtusum, *Sow. Thes. Conch.* pl. 100. f. 22–24.)
Hab. Mino-Sima, 63 fathoms; Kuro-Sima, 39 fathoms.

5. Radius scitulus, *A. Ad.* (Amphiperas scitula, *A. Ad. Proc. Zool. Soc.* 1854, p. 131.)
Hab. Tsu-Sima, 25 fathoms.

On the early Stages of Development of Orthopterous Insects. By Andrew Murray, Esq., F.L.S., Assistant Secretary to the Royal Horticultural Society.

[Read Nov. 20, 1862.]

I do not know why it should be so, but I am inclined to think that it is the fact, that although naturalists and scientific men are necessarily as liable to error as the rest of mankind, they are more reluctant to acknowledge their errors. Of course, in the abstract and general, they will acknowledge, as much as you please, they are all "miserable sinners"; but touch them on specific points, and, recalcitrant as all mankind are to such confessions, the naturalist, I think, kicks hardest. It may be that it costs him more to make them. His works are the children of his brain; he has travailed hard to bring them forth: they are the result of long thought and laborious investigation; and the more time and pains he has bestowed upon them, it is natural that the greater should be his reluctance to acknowledge them to be abortive. It is wrong, however, to speak of it as an acknowledgment. If he is once convinced that he is wrong, he is not less ready to acknowledge it than other men. But the difficulty is, to convince him. There are some men whom it is impossible to convince; they rest on the conclusion to which they have once come with all the unreasoning obstinacy of consistency; there are others who are only unconvinceable after they have committed themselves to print. The majority, however, are only *difficult* to convince. For myself, I claim to be one of these reasonable men. When facts and arguments have all declared against me, and I have no longer a leg to stand upon, I will handsomely acknowledge myself to have been in the wrong; but until then, I find it very difficult "to see the matter in that light."

This is my present predicament. Some years ago I published a few observations on the metamorphoses of Orthopterous and Hemipterous insects, which received more attention than they deserved, from their concurring with and supporting what appeared to be the views of one of our *heroës scientiæ*, Professor Owen.

During the past summer I have made some further observations, which have shown me that I had certainly misread the facts which I saw; and they have also suggested to me the doubt that I may be wrong in the conclusions to which I had arrived. These conclusions did not, however, rest alone on the facts which I had misread, but on independent observations made by Professor Owen; and it may thus be that the views which I formerly pro-

pounded are still well founded, although some of the props on which I rested them have to be withdrawn. In these circumstances I think I shall best perform my duty by simply laying before the Society, at this the earliest opportunity, the observations which lead me to think that I have been mistaken.

To enable the Society to understand the point at issue, I must crave their endurance whilst I recapitulate a little.

Fellows are of course aware that *Orthopterous* and *Hemipterous* insects are characterized by what is called a semicomplete metamorphosis, that is, that they quit the egg, not in the shape of caterpillars, but nearly similar in form to the perfect insect, but with some parts only partially developed; that, after so appearing, they at no time go into a dormant chrysalis state, but merely cast their skin a certain number of times, after each of which the wings and other parts of the insect make an advance towards their perfect state. The first stage of these insects after their appearance out of the egg has been treated by entomologists as a peculiar form of the larva state, which Mr. Westwood has characterized as "homomorphous" or "monomorphous," from its resemblance to the perfect insect after its first moultings; and when the wings begin to appear, it was said to pass into the pupa state, and was called an active nymph or pupa. Professor Owen, however, in his lectures on invertebrate animals, pointed out that we ought not to look upon these "homomorphous" larvæ as true larvæ, but that the true larval condition was to be sought for in the egg. He stated that "these insects" (the Orthopterous and Hemipterous) "are at one stage of their development apodal and acephalous larvæ, like the maggot of the fly; but, instead of quitting the egg in this stage, they are quickly transformed into another, in which the head and rudimental thoracic feet are developed to the degree which characterizes the hexapod larvæ of the *Carabi* and *Petalocera*; the thorax is next defined, and the parts or appendages of the head are formed, at which stage of development the young Orthopteran corresponds with the hexapod antenniferous larva of the *Meloë*; but it differs from all Coleopterous larvæ in being inactive, and continuing in the egg almost until all the proportions and characters of the mature insect are acquired, save the wings."

This statement was published in 1855, in the edition of Owen's 'Invertebrate Animals,' when I happened to be engaged in writing an account of a living specimen of the Leaf-insect (*Phyllium Scythe*) which was reared in that year in the Botanic Garden of Edinburgh; and it suggested to me doubts as to the received mode of explaining the phenomena of the development of these insects.

It appeared to me that if it were once determined that the larvæ of Orthopterous insects passed the early portion of their life in the egg, in the shape of maggots, something else must follow from this by way of corollary. It struck me that the necessary consequence of the early stage of the Orthopteran being a larva in the egg was, that it also passed the chrysalis state in the egg. I could quite understand that the perfect insect was eliminated out of the embryonic elements in the egg, in the same way that a chicken is hatched; but if the maggot were once hatched instead of the chicken, I know of no means, and no analogy, by which its vermiform character could be changed, except by passing through the dormant chrysalid state.

The solution which I proposed was that both the larval and chrysalid states were passed in the egg, and that what has been called the homomorphous larva or the active pupa, both by Westwood and Owen, was merely a phase of the perfect insect. Whether I am right in the former view is what I now doubt, but I retain as firm a conviction of the latter as ever.

The fact which I can testify from personal observation, and which is confirmed by various independent observers, that perfect-winged Hemiptera have been found coupling with incomplete, apterous (*quasi* larval) individuals, and not only so, (although as to this I do not speak from my own observation) but that two incomplete apterous individuals have been found coupling together, seems to me at least *primâ facie* evidence that the individuals exercising that function were not larvæ, but must have been perfect, although precocious insects.

The arguments by which I endeavoured to support the proposition that both the larval and chrysalis stages were passed in the egg were drawn from some observations upon the eggs of the Leaf-insect, which seemed consistent with the adoption of Professor Owen's observations that the insect passed its larval stage in the egg, as an apodal vermiform caterpillar; for it will be observed that the whole of my reasoning depended upon this. Without this basis, I had no ground to go upon. All that I said was, admit that the larva is once a maggot, and I defy you to transform it into a perfect insect in any other way than by passing it through the chrysalis state. I say so still; but if it is not a maggot in the egg, if it appears at once (that is so soon as it has left its embryonal condition and assumed a distinct character) with the limbs and parts of the so-called active pupa, then there is no puzzle; there is nothing abnormal: it has only to grow as any other creature grows.

The instances I adduced in support of the above view were

two, the first, as already mentioned, drawn from the egg of the Leaf-insect, and the second from that of the Cockroach, both however from dried specimens.

That drawn from the egg of the Leaf-insect was as follows. The outer case, or capsule, or egg as it is generally called, is about the size of a small pea, of a corticaceous honeycombed texture, lined within with a porcelain-like shell, and fitted with a little conical lid. Within it is an under membrane, which contains the yelk. This yelk is sometimes dried up and hardened, and may assume the form of a flasked-shaped transparent capsule. It had done so in my former specimen ; and its shape and appearance was so thoroughly that of a capsule, that it misled myself and every one who saw it, and I described it as such. I said that if we regarded the outer case or egg as the egg, then the inner membrane should be the chorion, and the flask-shaped capsule the yelk ; but as this capsule had a determinate form (which, indeed, is inconsistent with the liquid condition of a yelk), I thence inferred that, as it could not be the yelk, it might be the chrysalis.

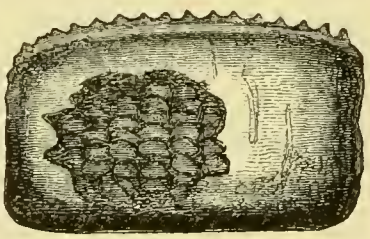
When I made these remarks, I had very imperfect materials to generalize from. This I fully explained. I said, "I have only examined one addled egg, and it chanced to be one with what I suppose to be the chrysalis in it. Some more fortunate individual will, I hope, ere long have the opportunity of settling the question ; and if, on opening eggs at an early period, he find a maggot, and at later periods this capsule, I think I shall then be entitled to say that it has been settled in my favour." Last year I was desirous of introducing a supply of these interesting creatures as objects of attraction to the Royal Horticultural Society's Conservatory, and I procured a supply of eggs from my friend Professor Fayrer of Calcutta. Unfortunately these proved all addled, and I have thus had ample material for investigation (so far as dried specimens allow), and have perfectly satisfied myself that the egg does not differ in its parts from any other egg. The outer case is merely the shell, the inner membrane is the chorion, and what I took for a capsule with a determinate shape is merely the yelk hardened into a particular form. I have found it assuming more or less of this form according to circumstances—sometimes only a part of it, and at others nearly the whole being so shaped.

The other instance which I brought forward was drawn from the egg of the *Blatta*, and was published in 1856. This was the insect from the study of which Professor Owen arrived at his conclusions. He says in his 'Lectures on Invertebrate Animals' (p. 437, edition 1855), "Metropolitan duties shut out much of the field of nature ;

but still she may be found and studied everywhere. I first learned to appreciate the true nature and relations of the nominally various and distinct metamorphoses of insects, by watching and pondering over the development of a Cockroach, which quits the egg as a Crustacean. I saw that it passed through stages answering to those at which other insects were arrested: there was a period when its jointed legs were simple, short, unarticulated buds, when its thirteen segments were distinct and equal—when it was apodal, when it was acephalous." Predisposed by this, I viewed a specimen of the egg of the *Blatta*, which shortly afterwards came into my hands, in a different light from what I should perhaps otherwise have done.

I received from my correspondents in Old Calabar a rude idol-like figure, in the corners of the eyes and behind the ears of which three or four Cockroaches' eggs had been laid. The eggs of this insect are compound eggs, formed somewhat like a broad pea-pod, in which spaces are partitioned off transversely for the young insects, which are arranged like peas in the pod. When the insect had laid them on this figure, it had plastered them all over with a cemented coating of chopped wood or straw, like a cocoon; and after this had been done, the whole figure had been rudely painted by the natives, and these cases were covered with the paint. No insect could have emerged without breaking through the case and the paint, which were both uninjured. I presume, at a certain stage on their passage homewards, the cold had killed them; for I found the contents preserved as they no doubt existed at the time when this event took place.

Fig. 1.



In one I found the mummied remains of what, in describing them, I called a row of unmistakeable grubs, packed closely, filling these partitions. Fig. 1 is a sketch of this; and from it it may be judged whether my description was not fairly warranted.

The next egg which I opened showed no grubs. It was undoubtedly further advanced. In it I found only two insects, but they had no longer the grub form; they were small, wingless *Blattæ*. One was perfect and fresh, the other somewhat injured; they were probably the last survivors of their brothers and sisters, whom they had no doubt devoured; for the egg, although ready to open, had never given egress to any of its inmates. One of these has been lost; but the other may be seen in the egg, as I found it.

From these materials, and from those drawn from the Leaf-insect, I fancied that I had demonstrated—

1. A grub in the egg. (The first egg of the *Blatta*.)

2. A cocoon in the egg, containing the unwinged, imperfectly developed insect. (The Leaf-insect.)

3. An unwinged, imperfectly developed insect in the egg, free from the cocoon, and ready to emerge. (The second egg of the *Blatta*.)

I have now to acknowledge and to show that, as regards the first, I was in error; the creature whose back looks so like one in the egg is not a grub. As regards the second, I have already shown that this was merely the yelk hardened into a cocoon-like shape. And as regards the third, it is quite true, but, without the first and second, proves nothing of what either Professor Owen or myself thought to exist.

Since the publication of these papers (now six years ago), I have always wished for the opportunity of investigating the matter further, but, until the present year, never enjoyed it. I have already told what I have found in this year's arrival of Leaf-insect eggs. I shall now explain what I have learned from the *Blatta*. In Scotland (my former residence) Cockroaches are only exceptionally abundant, and I never had the good luck to have any in my house. Since my removal to London, I cannot complain: I have the happiness to live in a house that is overrun with them, and I have friends through whom I have secured specimens from ships in the docks. Nowithstanding this *embarras de richesses*, I have found surprisingly few eggs, and most of those which I did get were already opened or advanced to the stage of No. 3. On having recourse to the gravid female, however, I have obtained, by the Cæsarean operation, two or three half-developed eggs, a careful examination of which compels me to own that the interpretation I put on the African egg with the grubs is not borne out by facts.

The half-developed egg is comparatively much narrower, although not greatly shorter, than the full-grown egg. On opening one of these soft, pale, and flaccid egg-cases, I found what, to all appearance, was a row of glistening white grubs. Had I stopped there (and that was all the length the dried African specimen allowed me to go), I could have sworn it was a row of grubs; but, placed under the microscope, the scene changed. The first thing that attracted my attention was a pair of flag-like flaps at one end. This I soon found to be the anal projections at the tail of the perfect insect. The other part seemed rounded, but on a little pressure being given to the glass, out gushed from under the thorax, where it had been closely packed up, a whole quantity of sausage-like matter. Can these be the intestines? thought I. It was

the legs—long, lanky, ribbon-like legs, among which were mixed the long antennæ. Figure 2 will show how these appeared. No

Fig. 2.

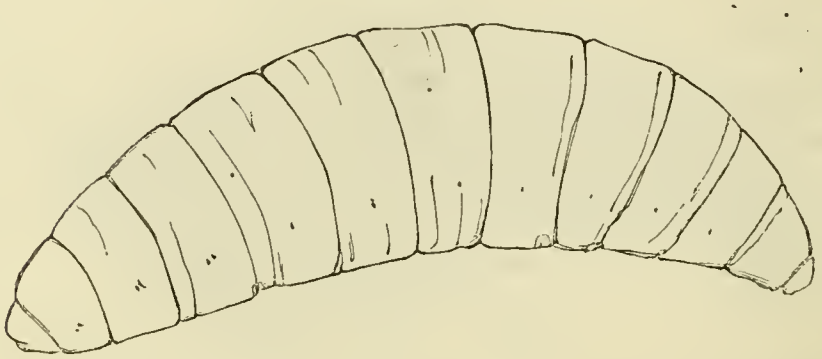
intestines or internal organs at all seemed yet to have been formed. The body was perfectly transparent and full of different-sized cells, which seemed a trifle more aggregated between the segments of the abdomen. In some there was no distinction between the head and thorax, or between the thorax and abdomen; in others this distinction began to appear (whether visible on account of position or not I could scarcely say, but probably it might be so). On the skin being ruptured, the cells poured out in quantity, but there was no appearance of any vessels or defined internal structure of any kind. There was, however, an indication of the eye externally.

I am therefore compelled to admit that, if my African specimens had been fresh and entire, I should have found a head and long legs curled up under the thorax, and not an apodous acephalous maggot.

So much by way of rectification of the mistake which I myself have committed. It remains to consider whether Professor Owen's statement, which led me wrong, is correct or not. If his observations bear the meaning which I attached to them, I certainly think he has fallen into a mistake. If he meant, as I supposed him to do, that the young *Blatta* ever was in the egg in the shape of a real acephalous and apodal larva, then I feel very confident that he is wrong; and he may have been misled in one of two ways. He may have fallen into the same mistake which I committed—mistaken the vermiform-looking back of the *Blatta* for a maggot. Or he may have fallen into an error which I have escaped. In opening one of these egg-capsules (not taken from the parent insect, but one which had arrived at maturity, and been deposited), I found a number of the larvæ in a disarranged, empty, sloppy state,

and in the midst of them a very comfortable, firm, plump, fat, true apodal and acephalous larva (fig. 3). It was obviously a parasite.

Fig. 3.



In the same capsule were found a large number of *Chalcidites*, some in chrysalis and some in the imago state. The apodous larva probably belonged to them. Professor Owen may have met with a similar parasite, and mistaken it for the real lord of the manor.

This is on the supposition that I have rightly interpreted Professor Owen's views. It may be that I have misunderstood him. In speaking of the insect passing its *larval* stage in the egg, he may have merely meant its *embryonic* stage. If this was what he meant, then probably we are at one in our meaning; for it has never occurred to me to question that, in its embryonic existence the *Blatta* went through the usual course of development observed in other animals in which it has been studied. I perfectly believe (although I have myself never traced its progress) that, as in the *Aphis*, whose development from the egg has been so clearly followed out and described by Professor Huxley—and, for that matter, as in the Vertebrata and in our own species—the first semblance of form which the germ of life assumes is a cord which may not inaptly be compared to something vermiform, and this shapeless shape or formless object gradually and imperceptibly assumes that shape which it is to bear when it leaves the egg. Consequently the long legs must at one time have been short ones, and still further back must have shown their first indications as buds.

This is embryonic development; and if it is this which Professor Owen means (and there are some passages in his work which now lead me to think that it may be so), then I misunderstood his meaning, and have been writing and thinking at cross purposes with him.

But if that is his meaning, then I must dissent from the relation which he appears to think exists between the development of these insects in the egg and the metamorphoses of other insects out of

it. I do not now think that we have any ground to call the embryos of the *Blattæ* "*apodal and acephalous larvæ*, like the maggot of the Fly," nor to hold that they "pass, in the egg, through stages answering to those at which other insects are arrested." I also doubt very much the fact that at any stage "its thirteen segments were distinct and equal." I can only say that, in my specimens at the epoch at which figure 2 was taken, the segments must have been at their earliest stage, for they were in some absolutely undistinguishable; and yet, in all, the long legs were by that time developed; and when the segments could be distinguished, they were by no means equal, the thoracic segment occupying its proper proportion—nearly a third of the whole.

There yet remains another supposition, which may perhaps be the true one, viz. that Professor Owen has founded his conclusions on the general physiological principles of development, as modified by erroneous observations, arising from either of the sources of error I have above indicated.

On the Species of *Fusidæ* which inhabit the Seas of Japan.

By Arthur Adams, F.L.S., &c.

[Read March 19, 1863.]

The species of Fusoid Gasteropods are tolerably numerous in the seas of Japan. In the north I found many of the large *Neptuneæ*, which in the south are represented by the group I have named *Siphonalia*. In the southern parts also linger a *Cominella* and a few *Euthriæ*. No species of *Fusus* proper was found by me further north than Tsuka Strait. *Hemifusus tuba*, used as a fog-horn by the fishermen, was observed from Tsu-Sima in the south to Hakodadi in the north.

The genus *Siphonalia*, A. Ad., will be found described, and twenty-one species enumerated, in the 'Annals and Magazine of Natural History' for March 1863.

1. Genus Hemifusus, *Swains.*

1. Hemifusus tuba, *Gmel.* (Murex tuba, *Gmel.*—Fusus tuba, *Enc. Méth.*—Pyrula tuba, *Lam.*—Cochlidium tuba, *Gray.*)
Hab. Tatiyama; Hakodadi; Tsu-Sima; Nagasaki.

2. Genus Fusus, *Klein.*

1. Fusus crebriliratus, *Reeve, Conch. Icon.* sp. 20.
Hab. Tatiyama; Okino-Sima.

2. Fusus Novæ-Hollandiæ, *Reeve, Conch. Icon.* sp. 70.
Hab. Tatiyama; Hakodadi.

3. Fusus Beckii, *Reeve, Conch. Icon.* sp. 34.
Hab. Tomo; Seto-Uchi.

4. Fusus pagoda, *Lesson, Illust. de Zoologie,* pl. 40.; *Rve. Conch. Icon.* sp. 32.
Hab. Kiusu.

5. Fusus gracillimus, *Adams & Reeve, Moll. Voy. Sam.*; *Rve. Conch. Icon.* sp. 69.
Hab. Tsaulian, 6 fathoms.

6. Fusus fragosus, *Reeve, Conch. Icon.*
Hab. Tsu-Sima.

7. Fusus perplexus, *A. Ad.*
F. testa fusiformi, tenui, turrita, alba, rufo tincta; anfractibus 7, convexis, longitudinaliter obsolete plicatis, transversim liratis, liris acutis æqualibus undulatis, lineis elevatis filiformibus alternantibus, liris transversis subnodulosis in medio anfractuum instructis; apertura ovata, canali aperto; rostro recto, crasso, apertura longiore.
Hab. Tatiyama.
A species of ordinary form and sculpture, but which I am unable to refer to any already described.

8. Fusus solidulus, *A. Ad.*
F. testa fusiformi, solida, albida, rufo tincta; anfractibus 8, ad suturas excavatis, convexis, longitudinaliter valde plicatis, plicis rotundatis, regularibus, transversim liratis, liris granulosis inæqualibus, interstitiis subcancellatis; apertura ovata, canali aperto, rostro brevi, crasso, reflexo, ad extremitatem truncato et vix dilatato.
Hab. Tomo.
A stout, solid species, with a short, wide, truncate beak and strongly plicate convex whorls.

3. Genus Priene, *H. & A. Ad.*

1. Priene cancellata, *Lam.* (Triton cancellatum, *Lam. Hist. An. s. Vert.* vol. ix. p. 638.—Fusus cancellatus, *Rve. Conch. Icon.* sp. 62.—Tritonium (Buccinum) cancellatum, *Midd.*)
Hab. Rifunsiri, Aniwa Bay.

2. Priene Oregonensis, *Say.* (Triton Oregonense, *Say, Ann. Lyc. Nat. Hist.* vol. iv. p. 165.—Fusus Oregonensis, *Rve. Conch. Icon.* sp. 61.)
Hab. Okosiri, 35 fathoms; Aniwa Bay.

4. Genus Neptunea, *Link.*

1. Neptunea antiqua, *Linn.* (Murex antiquus, *Linn., Rve. Conch. Icon. Fusus,* sp. 44.—Tritonium antiquum, *Müll.*—Fuscus bubaceus, *Bernardi, Journ. de Conch.* tom. vii. pl. 7. f. 1.—"Nisi" *in Japanese.*)
Hab. Aniwa Bay; Hakodadi.

2. Neptunea fornicata, *Fabr.* (Tritonium fornicatum, *Fabr.*—Fusus fornicatus, *Gray, Beechey's Voy.* p. 117; *Rve. Conch. Icon. Fusus,* sp. 63.

—T. Behringianum, *Midd.*—Fusus arthriticus, *Fisch. Journ. de Conch.* 1857, pl. 12. f. 3.—Fusus Cumingii, *Crosse, Journ. de Conch.*)

Hab. Aniwa Bay; Rifunsiri; Hakodadi; Gulf of Tartary.

3. Neptunea despecta, *Linn.* (Murex despectus, *Linn.*—Fusus despectus, *Rve. Conch. Icon. Fusus*, sp. 39.—Fusus carinatus, *Lam.*—Murex carinatus, *Penn.*—Fusus tornatus, *Gould.*—Tritonium despectum, *Fabr.*)

Hab. Aniwa Bay; Rufunsiri.

4. Neptunea æstuosa, *Gould, Otia Conch.* p. 123.

Hab. Kagosima.

5. Neptunea lurida, *A. Ad.*

N. testa ovato-ventricosa, cretacea aut sordide alba, epidermide fusca tenui obtecta, spira apertura breviore; anfractibus $4\frac{1}{2}$, convexis, ultimo obtusim postice subangulato; apertura ampla, ovata, intus livida; labio lævi, convexo, canali brevissimo aperto vix reflexo; labro intus lirato, prope marginem lævi, postice late subsinuato.

Hab. Aniwa Bay; Cape Tofuts.

This is the common edible Whelk of the Ainos. I cannot refer it to any of the varieties of *N. antiqua* mentioned by Middendorff, most of which, as mentioned above, also occur in Northern Japan.

Subgenus Sipho, *Klein.*

1. Sipho Sabinii, *Gray.* (Buccinum Sabinii, *Gray, Suppl. to App. Parry's Voy.* 1824, p. 240.—Fusus Sabinii, *Gray, Zool. Beechey's Voy.* 1839, p. 117.—Fusus Bernicensis, *King, Ann. & Mag. Nat. Hist.* 1846, p. 246.)

Hab. Aniwa Bay, 17 fathoms.

2. Sipho dilatatus, *Quoy & Gaim.* (Fusus dilatatus, *Quoy & Gaim. Voy. de l'Astr. Zool.* pl. 34. f. 15–17; *Rve. Mon. Fusus*, sp. 49.—Fusus adustus, *Phil.*)

Hab. Tsu-Sima.

3. Sipho plicatus, *A. Ad.*

S. testa fusiformi, subturrita, sordide alba, epidermide pallide fusca obtecta, spira apertura longiore; anfractibus 9, longitudinaliter valde plicatis, plicis distantibus, æqualibus, interstitiis transversim sulcatis; apertura trigonali-ovata; labio lævi, arcuato, canali mediocri lato vix recurvato; labro acuto, margine postice late sinuato.

Hab. Saghalcen; Aniwa Bay, 16 fathoms.

Fusus cretaceus, Reeve, is the only shell at all resembling this species. The spire is very elevated, and the whorls are strongly plicate.

5. Genus Cominella, *Gray.*

1. Cominella fucata, *A. Ad.*

C. testa acuminato-ovata, sordide grisea, fusco fulvoque fucata, spira brevi, conoidali; anfractu ultimo subventricoso; anfractibus 5, planis, postice coarctatis, suturis corrugato-plicatis transversim striatis; aper-

tura ovata, ampla; labio lævi, postice calloso, antice subplanulato; labro effuso, intus valde sulcato, margine crenulato.

Hab. Japan; Coll. Cuming.

Except in the form of the outer lip, which is very effuse, this species is of the ordinary form. The colour is dingy grey, stained here and there with fuscous.

6. Genus Euthria, *Gray*.

1. Euthria plumbea, *Phil.* (Fusus plumbeus, *Phil. Abild. der neuen &c. Conch.* pl. 1. f. 3.—Buccinum ferreum, *Reeve*, sp. 102.—Fusus viridulus, *Dkr. Moll. Japan*, pl. 1. f. 16.)

Hab. Tsu-Sima; O-Sima; Nagasaki.

2. Euthria badia, *A. Ad.*

E. testa fusiformi, badia, spira aperturam æquante; anfractibus 6½, convexiusculis, prope suturas excavatis, longitudinaliter plicatis, plicis undulosis, convexis, distantibus, transversim liratis, liris granulosis inæqualibus; apertura acuminato-ovata, intus livida; labio postice transversim rugoso, canali mediocri, ad sinistram inclinato recurvato; labro intus valde sulcato, margine postice sinuato et coarctato.

Hab. Tsu-Sima.

A brown fusiform species, with the aperture of a livid colour, the whorls plicate and transversely lirate, and with the outer lip internally strongly sulcate.

3. Euthria lirata, *A. Ad.*

E. testa fusiformi, rubro-castanea, spira apertura longiore, nucleo permagno; anfractibus 6, convexiusculis, cingulis transversis planis æquidistantibus æqualibus succinctis, interstitiis valde impressis, longitudinaliter crebre striatis; apertura acuminato-ovata; labio lævi, rotundato, canali producto, ad dextram inclinato, subtortuoso, vix reflexo; labro simplici.

Hab. Tsusaki.

A fusiform, reddish-chestnut species, with the whorls encircled with regular, flat, concentric ridges.

7. Genus Canthiridus, *Montf.*

1. Canthiridus erythrostomus, *Reeve.* (Buccinum erythrostoma, *Reeve, Conch. Icon.* sp. 14.)

Hab. O-Sima.

2. Canthiridus Cumingianus, *Dkr.* (Buccinum Cumingianum, *Dkr. Malak. Blätt.* July 1846.—Buccinum ligneum, *Reeve*, sp. 57.)

Hab. Seto-Uchi.

Subgenus Tritonidea, *Swains.*

1. Tritonidea Proteus, *Reeve.* (Buccinum Proteus, *Reeve*, sp. 51.)

Hab. Tsu-Sima.

2. Tritonidea balteata, *Reeve.* (Buccinum balteatum, *Reeve*, sp. 59.)

Hab. Tatiyama.

Notes on the Geographical Distribution of the Aculeate Hymenoptera collected by Mr. A. R. Wallace in the Eastern Archipelago.

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Were the student of the science of Entomology to start with the intention of making himself intimately acquainted with all the Orders of insects, and equally familiar with every species in those Orders, he would be attempting a task too vast for the allotted duration of human life, a space too brief to enable even the most gifted and industrious inquirer to master a tithe of the subject thus proposed to be carried out.

Such being the case (and I believe no entomologist will dispute the truth of the position), it becomes a necessity that the student should restrict his researches to a portion only of the wide field over which the science of entomology now ranges. Hence it has become the practice of entomologists in many cases to confine their studies to the fauna of their own country—some, and indeed a very large majority, studying only a single Order of that fauna and finding even this amply sufficient to engross the whole of their leisure time, whilst others, whose means in life are such as to give full scope to their inclinations, devote themselves to wider studies; yet even in such cases it is found to be imperatively necessary that a single Order should be selected, should the student propose to collect his materials from all quarters of the globe. In this more extended area of investigation it is that the student enters upon the enchanting field of geographical distribution. Of all the sections into which the study of entomology may be divided, there is none more alluring, and certainly none more important and useful, than that which embraces a knowledge of the geographical distribution of families, genera, and species.

Before proceeding to remark upon the additional knowledge of the Aculeate Hymenoptera that we have obtained through the exertions of Mr. Wallace, it appears highly desirable that a short survey should be made of the known geographical distribution of some of the more extensive genera, and of the more remarkable forms with which we were acquainted previously to Mr. Wallace's explorations.

The Ants are perhaps the most universally distributed insects belonging to the tribe of the Aculeata; they are found in the

greatest numbers, not only of individuals, but also of species and genera, within the tropics. Ants, however, are scattered in great profusion many degrees both north and south of those limits, penetrating, indeed, in the former direction even to the shores of Arctic America, whence Sir John Richardson brought several European species of the genus *Formica*,—*F. herculanea* and *F. pubescens* being amongst the number. *F. rufa*, *F. sanguinea*, *F. fusca*, *F. nigra*, and *F. umbrata* have been found at Hudson's Bay. *F. pubescens* and *F. lateralis*, both European species, are met with in the Northern States of America, and also in Canada; in fact most of the Ants of northern Europe will probably be found to occur in the great continent of North America. Several of our European Ants are also found in Algeria, as *F. emarginata*, *F. opaca*, *F. pubescens*, *F. viatica*, &c.; the latter also occurs in Palestine. Some species of the genus *Myrmica* have a very extensive range. The common British and European species *M. sulcinodis* is found also in Siberia and North China; *Atta capitata* occurs in Southern Europe, Spain, Algeria, and in Palestine. Some species of Ants which live in houses, and devour provisions, are found in all quarters of the globe.

The Mutillidæ, of which about 350 species are known, have a very extensive geographical range, and also an almost universal distribution. The number of species in northern Europe is not great; the type of the genus *Mutilla*, *M. Europæa*, occurs in Britain, France, Italy, Germany, Austria, and in Russia. The greatest number of species have been found in Brazil and South America; they are numerous in Africa; many occur in Australia, in North America, and in India; and, as will be seen by examining the table of geographical distribution, in the Eastern Archipelago they are very numerous.

Pompilidæ.—The insects which compose this extensive family are some of them found in most parts of the habitable globe. North America reproduces as it were the species of Northern Europe—that is, species so closely resembling them that their specific difference is difficult of detection. Some of the largest species of the Aculeate group are found in this family, and also some of the most beautifully adorned; the geographical range of individual species is very extensive.

The Sphegidæ are as universally distributed as the Pompilidæ. The genus *Ammophila* is found in all quarters of the globe; *Ammophila sabulosa* of this country occurs throughout Europe as far north as Lapland; it also penetrates into Algeria, where

A. viatica is also found. The Sphegidæ appear to be equally numerous both in the old and new world. Some of the genera are very local, as *Trigonopsis*, found hitherto only in Brazil. The genus *Pelopœus* is very widely distributed, but is not found in northern Europe; it occurs in the South of France, in Italy, Spain, Africa, India, the Indian Archipelago, China, Australia, and is very abundant both in North and South America. The brilliant insects belonging to the genus *Chlorion* are widely distributed in the tropics; four of the six known species are eastern; one occurs in North, the other in South America. No authentic record is known of the occurrence in England of the type of the genus *Sphex*; it is found in Southern Europe and in North Africa; the genus is found in Australia, and indeed in all parts of the tropics, in India and China, even in their northern provinces. The beautiful genus *Ampulex* is, I believe, strictly intertropical; twelve species are known, eight belonging to the old, and four to the new world; the type, *A. compressa*, is found in India, China, Java, and throughout the Eastern Archipelago.

The Larridæ, with a few exceptions, are inhabitants of the warmer regions of the globe. The type of the genus *Larra* has been recorded as a British species; but its title to that distinction is extremely doubtful. The geographical distribution of some of the species is worthy of notice. *Larra aurulenta* occurs in China, the Philippines, India, throughout the Eastern Archipelago, and in Africa from the Cape of Good Hope to Sierra Leone; we are acquainted with twenty Asiatic species, and the same number of African; the new world is known to possess at least thirty species. The very closely allied genus *Tachytes* is generally distributed, and numerous in species, forty having been described; two are found in England; the range of individual species is apparently very restricted. This genus was believed to occur almost everywhere except in Australia; but four species have been found in the latter locality, and one in New Zealand.

The species of the genus *Bembex*, although very generally distributed, have not occurred in Great Britain. The type, *B. rostrata*, is found throughout Southern Europe, in North Africa, and in Finland. *B. olivacea* has apparently a wider range, being found in Southern Europe, in Algeria, and in Tranquebar; about fifteen species are found in Africa, six in Australia, four in India, seven in South America, and about the same number in North America. The very closely allied genus *Monedula* has only occurred in North and South America.

Of the very numerous species which constitute the family Crabronidæ some are found in most parts of the world. The genus *Trypoxylon* is apparently generally distributed; about thirty species are now known; the type *T. figulus* occurs throughout Europe, in the warmest as well as the coldest latitudes, specimens having been received from Italy, France, Germany, Sweden, Finland, and Lapland. The typical genus *Crabro*, if we reject those species which have the abdomen petiolated and form the genus *Rhopalum* of Kirby, inhabits the temperate latitudes; it occurs throughout Europe, also in North America, at East Florida, and Hudson's Bay; the only species at present known from other countries are three from Northern India, two from Brazil, and one from Tasmania; the range of individual species is not very great.

Of the beautiful and very generally distributed species of the genus *Cerceris* about one hundred are known. The five species found in this country are common throughout Europe; *C. ornata* has also occurred in Algeria; about thirty species are found in Europe, forty in Africa, two in Australia, twenty in the East, and thirty in North and South America. The very closely allied genus *Philanthus* is much less numerous, about thirty only being known. The type, *P. triangulum*, is found throughout Europe; species are scattered over most parts of the globe, extending north as far as Denmark, but they have not occurred in Australia to my knowledge.

Family Vespidæ.—With the exception of the Formicidæ, no family contains individual species so widely distributed as are those belonging to the Vespidæ. The typical species, *V. vulgaris*, is common throughout Europe, it occurs in Madeira, North Africa, and is also found in North America; *V. rufa* occurs in America, and, as well as *V. Germanica*, is also met with in Algeria; the latter species has also been found in Northern India and in Syria. One or two species appear to be confined to Northern Europe: *V. Norvegica* is found in the north of England, in Sweden and Norway, *V. media* being apparently confined to the two latter countries. *Vespa crabro* is a species probably more widely distributed than any other belonging to the family; it occurs throughout Europe, to the north, as far as Lapland; it may also prove not to be specifically distinct from *V. orientalis*, which occurs throughout the East, or from *V. crabroniformis* from North China. About forty species of this genus are known, but none have hitherto been found in Australia or in South Africa. *V. orientalis* is found in Greece,

Turkey, Egypt, India, and in some of the islands of the Eastern Archipelago.

Of the extensive genus *Polybia* about sixty species have been described; but only three are of the Old World—two being from China, and one from Africa. In Brazil these insects abound to a degree that no one, without visiting that country, can form any approximate idea of; many species are of minute size; and the nests constructed by them are amongst, if not, the most beautiful examples of insect architecture. The range of the insects of this genus in America is almost entirely tropical; none have been found in North America. The Wasps composing the genus *Chartergus*, whose pasteboard nests are so well known, are also tropical, being principally found in Brazil. The genus *Nectarinia* is composed of honey-gathering wasps; they are principally found in Brazil.

Having taken a cursory view of the geographical distribution of the principal genera of the Formicidæ, the Fossores, and the Vespidæ, it will be equally desirable to treat the family Apidæ in the same brief, but we hope instructive manner. The Bees most nearly allied to the Vespidæ, taking the form of the tongue as the principal guide in arrangement, are those included in the genus *Colletes*. This genus has a wide geographical range: the species are found throughout Europe, in the Canary Islands, in Egypt, at the Cape of Good Hope, in Chili, Columbia, and North America; no species has yet been found in India, China, or in the Eastern Archipelago. Two or three very closely allied genera are found in Australia and New Zealand.

The genus *Prosopis*, which belongs to the same subdivision as *Colletes*, the Obtusilingues, is of universal occurrence: many fine species occur in Australia, in India, North and South America, and also in Africa.

The extensive genus *Halictus*, of which about one hundred species are described, is confined principally to temperate regions; they are found throughout Europe, in North America, in Northern India, and also in North China. In tropical India, and indeed throughout the Eastern Archipelago, this genus is represented by a very closely allied one, namely the genus *Nomia*; in South America and Brazil it is replaced by the genus *Augochlora*,—the latter genus containing some of the most brilliantly coloured species to be found in the family of the Apidæ: green of every shade, fiery copper, purple, and burnished gold are the colours which principally adorn these beautiful insects. A few species of the

genus *Halictus* have occurred in Australia; two or three are from the Arctic regions.

The genus *Andrena* is the most numerous in species of the whole tribe of the Anthophila: about one hundred and fifty species are described; they are almost exclusively confined to the temperate portions of the globe. About one-half of the known species are found in Britain; twenty have been recorded from North America; the remainder occur in the south of Europe, Madeira, and Algeria. The species found in this country are generally distributed throughout the north of Europe; and a few of them reappear in North America: *A. Clarkella* occurs in Nova Scotia; *A. perplexa* cannot be separated from our *A. nitida*, and several other species appear to be common alike to Great Britain and America. *A. Hattorfiana*, which occurs in the south of Europe, ranges thence as far north as Finland; and *A. cineraria* has an equally wide geographical range. *A. pilipes* occurs in Finland, is common throughout Europe, and penetrates into North Africa. *A. varians* is equally common in the same localities, and is also found in Nova Scotia; *A. albicans* has a similar distribution.

Osmia is a genus consisting of about fifty species, forty of which are confined to Europe, many of them being very generally distributed. *O. ænea* is perhaps the most widely scattered of any known species; it is common in all parts of Europe; it occurs in Madeira, in the Canaries, and is also found in Algeria; several species are common in Egypt; the genus is found at Port Natal; but not a single species is known from the East or from Australia.

Of all the genera of Bees, *Megachile* is perhaps the most truly cosmopolitan: in temperate latitudes, in the tropics, and in the arctic regions these Bees are alike found; Sir John Richardson brought species from Lake Winipeg; many are known from Hudson's Bay and Nova Scotia. The type of the genus, *M. centuncularis*, occurs throughout Europe, and is also found in the United States, in Canada, and at Hudson's Bay. About twenty species are known from Australia, twice that number from Africa, twenty-six from India, and Mr. Wallace has added twenty-one new ones from the Eastern Archipelago.

Of the genus *Anthidium* about one hundred species are known, but only one is found in Britain, *A. manicatum*; this Bee is common throughout Europe. About thirty-nine species occur in the continent of Europe, and about the same number are known from Africa, six or seven from Brazil and Chili, and about ten

from North America; not a single species has yet been found in India, China, the Philippines, or in any of the islands in the Eastern Archipelago.

The geographical distribution of the parasitic Bees, as might be expected, is apparently regulated by the distribution of the genera upon which they are parasitic. The genus *Nomada*, parasitic principally upon the Andrenæ, is found wherever the latter genus occurs; *Nomada* is consequently very rare in India and in the Eastern Islands: a few species have been discovered, these probably being the parasites of the genus *Nomia*. Mr. Wallace discovered two species; these, together with two from Northern India, one from North China, and one from the Philippines, are all at present recorded from the East; about fourteen are known from Algeria, and twelve from North America.

Cœlioxys, the parasite of *Megachile*, is cosmopolitan. Upwards of fifty species have been described; they are of course found in all climates. Although no species has yet been received from Australia, I am confident there will be several, the genus *Megachile* being common in that country.

The genus *Crocisa*, although not consisting of more than ten or twelve species, is very widely distributed. It does not occur in England; but three species are found in Europe: one of these, *C. histrio*, is also found in Algeria and in India. Three have been found in South Africa, two in Australia, and one in North China.

There are no less than eight genera of parasitic Bees peculiar to South America: of these, *Euritis*, *Melissa*, *Mesocheira*, *Thalestria*, *Ctenioschelus*, *Acanthopus*, and *Aglaë* are only found in Brazil; of the genus *Liogastra* two species occur in Brazil, and one in Mexico.

The genus *Melecta* is also restricted in distribution; nine species have been described as European, one is Algerian, and two have been recorded from Chili.

In the family Scopulipedes, all of which are true working Bees, we find the genera *Eucera* and *Tetralonia*, very closely allied to each other, consisting of upwards of one hundred and twenty species. The present known range of the former genus is Europe, Egypt, and North Africa; the type *E. longicornis* is common in Europe and Algeria. The genus *Tetralonia* does not occur in England; but about twenty species are found in Europe; it is also found in North Africa, in India, China, and Australia; several species are found in Brazil and other parts of South America; but no species has yet been discovered in any of the islands of the East-

ern Archipelago. *Melissodes*, another genus of the long-horned Bees, is strictly American, most of the species being found in the South, principally in Brazil. *Anthophora* is a very extensive genus, one hundred and twenty-three species having been described. The type, *A. retusa*, is found in all parts of Europe, from Italy to Sweden; *A. acervorum* is equally widely distributed; *A. furcata* is found as far north as Lapland; about forty species are inhabitants of Europe; about thirty-seven have been discovered in Egypt and Algeria; and a few have occurred in South Africa: three species have been found in Australia; one of these, *A. cingulata*, I am strongly inclined to believe, is only a variety of *A. zonata*, which is common to China, the Philippines, Ceylon, India, Java, and throughout the Eastern Archipelago; Mr. Wallace found it in almost every island that he visited; he also discovered three beautiful new species—one in Borneo, one in Celebes, and one in Key Island.

Xylocopa is a genus containing a large number of species very widely distributed, although none are found in Great Britain: *X. violacea* is the type of the genus. About seven species are found in Europe, about thirty in Africa, and about fourteen in India. *X. æstuans* is widely distributed, being found in China, India, Celebes, Aru, Timor, and Australia. Mr. Wallace added eight new species to the list, already amounting to one hundred and one, described in various works. Many fine species are found in Brazil and other parts of South America; but only six are recorded from North America.

We have now to direct our attention to the division of the Social Bees, commencing with the genus *Bombus*, which comprises the well-known Humble-Bees. These insects are found in Europe and America, being scattered over both the north and south continents of the latter. About eighty species are known, thirty-six being indigenous to Europe, eighteen of which belong to the fauna of this country; thirteen species are known from China, India, and Java; but Mr. Wallace did not find one in the Eastern Archipelago; and none have occurred in Australia or in South Africa. The geographical range of the genus is, however, very great, several species being found in Brazil; and Ross, the arctic navigator, found two species in Boothia Felix: more recently Sir John Richardson brought two or more species from the Great Bear Lake; one of of these I could not separate from the *B. hortorum* of this country; the latter insect therefore ranges from the Arctic regions to Spain and Italy. Ten of the British species are also found in Lapland;

one has also been described from Kamtschatka; fourteen species are known from North America, and eight from Brazil and South America.

The social stingless genera of honey-gathering Bees, *Melipona* and *Trigona*, are at present known as being principally South American; about sixty-seven species of these genera are recorded from that locality. All the known species of *Melipona* are South American. Of the genus *Trigona* one species is described from Australia, and one from Ceylon.

The genus *Apis* includes the Honey-Bees proper: the number of known species previous to Mr. Wallace's discoveries was about fifteen. The typical species has been conveyed to most parts of the habitable globe; but, judging according to our present knowledge of the range of species in a state of nature, their distribution or geographical range appears to be limited. *Apis mellifica*, of which *Apis ligustica* would appear to be only a climatal variety, does not appear to range beyond the temperate regions of Europe. Our knowledge of the exotic species is too limited at present to enable us to add much information respecting them.

In the sketch here attempted, it will be observed that we have confined our remarks to the predominant genera, omitting none that appeared important as bearing upon geographical distribution; we will now proceed to offer some remarks upon the various species collected by Mr. Wallace in the Eastern Archipelago.

In the introductory remarks, it will be observed that I have, in some instances, said that the range of British species extends to North America—*Vespa rufa* and *V. vulgaris* being examples of this kind. I may here remark that such determinations have not been based upon colour alone. It has been proved long ago that the males of *Vespa* in different species have generative organs of totally different forms; and the constancy in form in each individual species renders such forms unerring guides in their determination. I have had recourse to this test in the cases alluded to above, and also in those of *V. crabro* of this country and *V. crabroniformis* from China: I have not been able to obtain a male of *V. orientalis*, but I expect it will prove to be a variety of *V. crabro*.

The above conclusions lead me, in the next place, to notice a very important circumstance to be regarded in the study of the geographical distribution of species—the effect, namely, of climate on their coloration. I have previously remarked upon the richness of colouring peculiar to *Apis ligustica*, or, perhaps more correctly, to the form of *A. mellifica* so termed, and which

colouring is soon lost when the two forms commingle, which cannot be prevented when they are kept in close proximity. Now the colouring of *Vespa rufa* is the reverse of this: the more sober-coloured insect is the British; examples from Nova Scotia are exceedingly bright in colour, much, very much more so than any found in Great Britain; specimens from Sweden are intermediate in colour. If I am right in considering *V. orientalis* a variety of *V. crabro*, then the more highly coloured form is Indian, whereas in Northern China the species again exactly resembles the British in colouring.

These instances apparently prove that different species are affected by climatal influences in opposite ways: it cannot be laid down as a rule that a species is necessarily of a more sombre colour in colder latitudes. We shall have some further observations to offer on this subject when remarking upon the distribution of the different species of Vespidæ.

In a collection of Hymenoptera made by an entomologist so eminently qualified as Mr. Wallace, the Formicidæ (as might be expected) constitute a very important portion, the number of species amounting to about two hundred and eighty. Of these, upwards of two hundred proved new to science. The majority of the larger species were previously known. *Formica gigas* of India and Malacca was found by Mr. Wallace in Singapore and Borneo. *F. compressa*, known as Indian, and also from China and the Philippines, is now known to inhabit Borneo; this Ant, no doubt, will be found throughout the Archipelago, as it has occurred in Australia. It is very interesting to find the European genus (as it has hitherto been regarded) *Tapinoma* occurring in Celebes, Malacca, and Bachian.

The genus *Polyrhachis* includes all those species that closely resemble *Formica*, but which have the thorax and node of the peduncle armed with spines or hooks: of this genus fifty-eight were described, to which number Mr. Wallace has added seventy-seven. As the type of the genus I regard the *Formica bihamata* of Drury; it was known as an inhabitant of India and Sumatra; it has now been captured in Celebes, Bachian, Ceram, and Waigiou. *Polyrhachis sexspinosa* of India and the Philippines has been taken in the Aru Islands, and also in Waigiou. Eight or nine species are known from Africa, six from Australia, and four from Brazil. It would therefore appear that the metropolis of the genus lies in the East. The species of this genus construct small semicircular nests of a kind of network on the

leaves of trees and shrubs. Their communities are small, seldom exceeding twenty individuals; such is the concurrent testimony of Mr. Jerdon and Mr. Wallace. No species has occurred in Europe.

The genus *Œcophylla* consists of two species, one Eastern, the other African. *Œ. smaragdina* is generally distributed in the East; it builds large nests on trees, uniting together a number of leaves for that purpose: this species is found commonly in India, China, the Philippines, and, by Mr. Wallace, in Borneo and Celebes; it has also occurred in Sumatra and Java, and is no doubt widely distributed; I have considerable doubts of its being really specifically distinct from the African species *Œ. virescens*, which insect also occurs in Australia.

In the next family, the Poneridæ, the genus *Odontomachus*, previous to Messrs. Wallace and Bates visiting Brazil, consisted of four known species from Brazil, one from Cuba, and one from Ceylon; through the exertions of those naturalists it now numbers twenty-two species, nine having been discovered in the East by Mr. Wallace. These insects are essentially tropical; one species only has occurred in Australia: some of the species are widely distributed; *O. simillimus* is found in Ceylon, Celebes, Aru, Ceram, and Waigiou.

The genus *Ponera* is almost universally distributed; we have one British species. Twelve species were known from the East previous to Mr. Wallace's expedition to those latitudes; to that number he has added thirty. Of the range of individual species we have scarcely any data: the type, *P. contracta*, is found in most parts of Europe, it also occurs in the Island of Madeira; one or two of the Bornean species also occur in Celebes and Bachian.

Of the interesting genus *Typhlopone* twelve species are described, eight being found in South America, two in Africa, and one in Ceylon, and Mr. Wallace has added a fine species from Borneo. It has been suggested that these insects, all that are yet discovered being workers, are sexes of the genus *Labidus*; should this prove to be the case, probably the Eastern species of *Typhlopone* may prove to be sexes of the genus *Enictus*, three species of which have occurred in India.

Dorylus, belonging to the same family as *Labidus*, although so common in India, does not appear to range into the Archipelago; at least no specimen was found by Mr. Wallace. The habits of the genus being nocturnal, probably accounts for the fact of no one having discovered either the female or worker of *Dorylus*.

To the family Myrmicidæ Mr. Wallace's additions are very

important. To the typical genus *Myrmica* twenty-eight species are added: the cosmopolitan species *M. molesta* was found at Singapore and Celebes; it is truly a domestic species, few localities being free from it; it is conveyed in merchandise to all parts of the globe, and, apparently, propagates equally well in all latitudes.

Several new genera belonging to the Myrmicidæ are added. One of these, *Heptacondylus*, was founded upon the examination of workers which are remarkable for having only seven joints in the antennæ; subsequent investigations have led me to believe these to be the workers of the genus *Myrmecaria* of Saunders—a female of the latter genus having been sent with workers of *Heptacondylus*; the female has the same number of joints in the antennæ as the workers, the antennæ of the males having thirteen joints. This genus is found at Port Natal, in Borneo, and Java.

To our knowledge of the geographical distribution of the Cryptoceridæ much information has been added. The typical genus, *Cryptocerus*, is peculiar to South America,—Brazil having furnished the majority of the species. Of the genus *Mcranoplus* eight species are at present known: three are from Brazil, one from India, and four, discovered by Mr. Wallace, are from Malacca, Borneo, and Aru: this genus is also found in Australia. Of the genus *Cataulacus* nine species are known—five having been discovered by Mr. Wallace, found in Malacca, Borneo, Key Island, Waigiou, and Mysol.

The genus *Echinopla* is placed in the family Cryptoceridæ in the papers descriptive of Mr. Wallace's insects; but it belongs to the Formicidæ: when first received, a single example was all the material for examination; subsequently others have been obtained and the true situation of the insect ascertained. Seven species have been discovered; they are from Malacca, Borneo, Celebes, Singapore, Aru, and Ceram.

The Mutillidæ are of universal occurrence, the typical genus *Mutilla* as at present constituted being perhaps the most extensive in the order Hymenoptera. Thirty-six new species have been discovered by Mr. Wallace. Some species have a wide geographical range; *M. suspiciosa* occurs in Borneo, Celebes, Bachian, Bouru, and Amboyna. Several of the known Indian species were found in Celebes and Borneo.

One of the most interesting discoveries made by Mr. Wallace, with respect to the geographical distribution of the genera of Hymenoptera, is his tracing species of the genus *Thynnus* to the islands Bachian, Gilolo, Ceram, Waigiou, and Mysol,—Gilolo being the

most northern locality known for this genus of insects. The only species hitherto found in the eastern hemisphere have occurred in Australia and Tasmania, none having been found north of the former continent previous to the captures made by Mr. Wallace. Many species and genera are found in similar latitudes in Brazil.

The family SCOLIADÆ is one of great extent, and of wide geographical distribution, some species being found in all the quarters of the globe. Not a single species is found in England; but five or six occur in Europe. Some species have a wide distribution; *Scolia erythrocephala* is found in France, Italy, Spain, Algeria, and Egypt. Thirty new species were discovered in the Archipelago; one, the *S. dimidiata*, is found in India, Celebes, Bachian, Gilolo, Ceram, Bouru, and Amboyna. The distribution of other species is equally extensive, as will be seen on a reference to the table.

The POMPILIDÆ is a very extensive family, nearly four hundred species having been described; the typical genus *Pompilus* consists of upwards of two hundred and ninety species, fifty-six having been discovered in the Eastern Archipelago. Some species are known to have a wide distribution: *P. analis* of Fabricius, originally known as an Indian species, has been found in Celebes, Bachian, and Java; *Agenia blanda* inhabits Singapore, Borneo, Celebes, Key Island, and Ceram; *Macromeris violacea* is perhaps the most generally distributed insect belonging to the family; it is found in India, China, Borneo, Celebes, Java, Aru, Ceram, Bouru, and New Guinea.

The beautiful genus *Ampulex* is exclusively tropical; it is found in India, Africa, and South America. The type, *A. compressa*, occurs in India, China, Java, Celebes, and the Mauritius; four new species are added from the Archipelago, the genus now consisting of fifteen species.

Much information respecting the distribution of the SPHEGIDÆ will be found by reference to the table. *Pelopœus spirifex*, a species common to Europe, was found by Mr. Wallace in the island of Timor. *Sphex sericea* of Fabricius is found in the Philippines, throughout the Archipelago as far south as the island of Timor. Extensive as this distribution certainly is, it is not comparable to that of *Sphex argentata*, which occurs in the south of Europe, in India, Sumatra, Java, Celebes, Aru, Bachian, Dory, and Ceram; in Africa it has been found at Congo and Sierra Leone; in America, at St. John's Bluff, East Florida.

The genus *Larrada* is widely distributed: there is no British species; but four or five occur in Europe, about thirty have been

found in the East, nearly twenty in Africa, the rest in North and South America, with the exception of two or three from Australia. *L. aurulenta* is one of the most widely distributed species of the genus, it is found in China, India, throughout the Eastern Archipelago, at the Cape of Good Hope, and on the Gambia.

The genus *Pison* is composed of species that do not appear to be abundant in any locality, though they occur in all quarters of the globe. About twenty-four species are described; four are added to the list from the Archipelago: individual species do not appear to be widely distributed.

The family Crabronidæ is one of great extent, the majority of its members being European. Of the genus *Trypoxylon* about twenty-two species were described previous to Mr. Wallace's researches, two only being known from India; nine were discovered in the Archipelago; the genus also occurs in Europe, Africa, and North and South America.

Of the extensive genus *Crabro* the majority of the species are found in Europe and North America; two are now recorded from Borneo, one from Celebes, and one from Aru; two species only were previously known from the East.

Of the genus *Psen* one species was found in Celebes, and one in Mysol. The genus had not previously been recorded from the East; four European species were known, and one Brazilian.

To the genus *Cerceris* five new species are added from the Archipelago; thirty are found in Europe, and about the same number in Africa; sixteen are recorded from China, India, Sumatra, and Java; and three or four are known from Australia.

Of the genus *Philanthus* four species are known from India and Ceylon, and Mr. Wallace discovered one in Celebes. Species belonging to this genus do not appear to be very numerous in any locality: four occur in Europe, ten are known from Africa, seven from North America, and about the same number from South America.

In no family of the Aculeata have Mr. Wallace's researches added so much to our knowledge of geographical distribution as in that of the Vespidæ. To the rare genus *Gayella*, belonging to the Eumenidæ, a new species from Borneo is added; the two previously known are from Chili.

Of the genus *Eumenes* about ninety species were recorded, when through Mr. Wallace's researches eighteen new ones were discovered in the Archipelago. The geographical distribution of some species is very extensive: as an example *E. arcuata* may

be quoted; this species occurs in Northern India, in Madras, Borneo, Bachian, Dory, Mysol, and in Australia.

The majority of the species belonging to the genus *Rhynchium* are tropical. The *R. hæmorrhoidale*, first recorded as an Indian species, has occurred in Malacca, Singapore, Java, throughout the Eastern Archipelago, and also at the Cape of Good Hope; an examination of examples from these various localities shows a great variation in the colour of the insect in different situations, and at the same time how constant those varieties are to the countries in which they are found: Indian examples are black, with the legs, antennæ and tip of the abdomen red; in Gilolo not only are the same parts red, but the head and prothorax are of the same colour; specimens from Bachian have scarcely any trace of red, some being almost or entirely black: the most highly coloured examples are found at Amboyna and Ternate; these have the head, entire thorax, the tip of the abdomen, and the margins of all the segments red. Numerous instances might be adduced in order to show that, amongst the Vespidæ, bright or sombre colouring is not to be regarded as a character of much value when we endeavour to ascertain the limit of a species; form and sculpture alone can be relied upon for that purpose.

The genus *Odynerus* is of universal distribution. In Arctic America, in Europe, throughout both North and South America, in Asia, in Africa, and in Australia these solitary wasps are abundant. Nineteen new species will be found in the tabular list of species from the Eastern Archipelago.

Amongst the Vespidæ, the species of the genus *Ischnogaster* have hitherto been of very rare occurrence; our list will show that seven new species have been discovered,—only four having been previously known—two from Java, one from New Guinea, and one from Cayenne. Previous to Mr. Wallace's captures, not a single example existed in any collection in this country. The metropolis of the genus would appear to be the islands of the Eastern Archipelago.

To the erratic genus *Vespa* no great addition of species could well be expected: four new ones will be found in the table; these added to the previously recorded species from the East make the number twenty-two from that quarter. The genus becomes rare as we approach the equator from the north; the island of Java is, apparently, its limit south of the line. The genus has not been found in New Guinea or Australia, neither has it occurred in

South Africa, and I believe no one has recorded the capture of a species south of the Isthmus of Panama.

To our knowledge of the geographical distribution of the tribe Anthophila, which contains the various families and genera of bees, much has accrued through the exertions of Mr. Wallace. Of the genus *Prosopis* only a single species was known from the East; our table will show that two have been discovered in Mysol, one in Key Island, and one in Dory.

The genus *Sphecodes* is very rare in India and the adjacent islands; one species was discovered in Celebes.

Of the genus *Nomia* seventeen species are recorded in the tabular list, not a single example having been previously discovered in Malacca, Singapore, Celebes, Aru, Gilolo, or Mysol.

Nomada is a genus of very rare occurrence within the tropics; one species was, however, found in Ceram, and one in Timor. Four new species of Honey-Bees were discovered—two in Borneo and two in Celebes.

Of the genus *Trigona*, which is composed of the stingless species of Honey-Bees, two only were previously described from the East; nine new ones are now added to that number from the Eastern Archipelago.

The Tenthredinidæ are apparently rare insects within the tropics. One or two interesting discoveries of genera may be noticed, namely a species of *Oryssus* from Aru, a *Xiphydria* from Aru, and a second species from Amboyna; it is also very interesting to find that the genus *Tremex* inhabits the same regions—a fine new species having been discovered in Borneo, and another in Aru.

The following Table exhibits the known Species of Aculeate Hymenoptera inhabiting the Eastern Archipelago, and their geographical distribution:—

	China.	India.	Philippines.	Malacca.	Borneo.	Singapore.	Gilolo.	Ternate.	Sumatra.	Java.	Waigiou.	Bachian.	Dory.	Mysol.	Celebes.	Ceram.	Amboyna.	Martabello.	Bouru.	Key.	Aru.	Timor.	Kaisaa.	Australia.	New Hebrides.	Madagascar.	Africa.	Europe.
ormica																												
gigas	*	*	..	*	*	*	..	..	*	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	
compressa	*	*	*	..	*	..	..	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
stricta	..	*	..	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..		
festina	*	..	..	..	*	..	..	..	*	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
mistura	..	..	..	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
pilosa	..	..	..	..	*																							
ruficeps	..	..	..	..	*																							
badia	..	..	..	..	*	*																						
diligens	..	..	..	*																								
irritans	..	..	..	*	*																							
fervens	..	..	..	..	*																							
gracilipes	..	..	..	..	..	*	..	..	..	..	..	..	..	..	*	..	..	..	..	..	*							
irritabilis	..	..	..	..	*																							
sedula	..	..	..	..	*																							
exasperata	..	..	..	..	*																							
tenuipes	..	..	..	..	*																							
camelina	..	..	..	..	..	*																						
pallida	..	..	..	..	*	*	..	..	*	..	..	*	..	..	*													
fragilis	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	..	..	..	*							
fulvitarsis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*							
coxalis	..	..	..	..	..	..	..	..	..	..	*	..	..	*	..	..	..	..	..	..	*							
cordata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*							
oculata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*							
mutilata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*							
quadriceps	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	*							
lævissima	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	..	..	*							
nitida	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	*							
scrutator	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*							
angulata	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*							
familiaris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	*							
subtilis	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	..	..	*							
vitrea	..	..	..	..	..	..	..	..	..	..	..	*																
cruda	..	..	..	..	..	..	..	..	..	..	..	*																
lactaria	..	..	..	..	..	..	*	..	..	..	..	*																
incursor	..	..	..	..	..	..	..	..	..	..	..	*																
rufifrons	..	..	..	..	..	..	..	..	..	..	..	*																
pavida	..	..	..	..	..	..	..	..	..	..	..	*	..	*														
familiaris	..	..	..	..	..	..	..	..	..	..	..	*	..	..	*													
Dorycus	..	..	..	..	..	..	..	..	..	..	..	..	*															
desecta	..	..	..	..	..	..	..	..	..	..	..	..	*															
consanguinea	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
circumspecta	..	..	..	..	..	..	..	..	..	..	*	..	..	..	*													
leucophæa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
tropica	..	..	..	..	..	..	*																					
virulens	..	..	..	..	..	..	*																					
longiceps	..	..	..	..	..	..	..	..	..	..	*																	
Tapinoma																												
glabrata	..	..	..	*																								
thoracica	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
nitida	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
pratensis	..	..	..	..	..	..	..	..	..	..	..	*																
gibba	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
albipes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													

	China.	India.	Philippines.	Malacca.	Borneo.	Singapore.	Gilolo.	Ternate.	Sumatra.	Java.	Waigiou.	Bachian.	Dory.	Mysol.	Celebes.	Ceram.	Amboyna.	Martabello.	Bouru.	Key.	Aru.	Timor.	Kaisaa.	Australia.	New Hebrides.	Madagascar.	Africa.	Europe.
Polyrhachis																												
bihamatus	..	*	..	..	*	..	..	..	*	..	*	*	*	..	*	*												
relucens	..	*	..	..	*																							
carinatus	..	..	..	*	..	*																						
defensus	..	..	..	..	..	*	..	..	..	*																		
constructor	..	..	..	..	*																							
ruficornis	..	..	..	..	*																							
carbonarius	..	..	..	*																								
textor	..	..	..	*																								
chalybeus	..	..	..	*	..	*																						
nitidus	..	..	..	..	*																							
villipes	..	..	..	..	*																							
modestus	..	..	..	..	..	*																						
Pandarus	..	..	*	..	*	..	..	..	..	*																		
Hector	..	..	..	..	*																							
lævigatus	..	..	..	*	*																							
cuspidatus	..	..	..	..	*																							
flavicornis	..	..	..	..	..	*																						
equinus	..	..	..	..	*																							
Dives	..	..	..	*	..	*	..	..	..	..	..	*	..	..	..	*												
vindex	..	..	..	..	*																							
sericatus	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	*	*	..	*	*	..	..	*			
sexspinosus	..	..	*	..	..	..	..	..	*	*	*	..	*	..	..	..	..	..	..	..	*	..	..	..				
marginatus	..	*	*	..	..	..	..	..	..	..	*	*	..	..	..	..	..	..	..	..	*	..	..	..				
hostilis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..				
longipes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..				
serratus	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	..	..	..	*	..	..	..				
scutulatus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	*	..	..	..				
mucronatus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..				
geometricus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..				
irritabilis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..				
lævissimus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..				
bellicosus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..				
Hector	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..				
rufofemoratus	..	..	..	..	..	..	..	*	..	..	..	..	..	..	..	*	..	..	..	..	*	..	..	..				
phyllophilus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
compressicornis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
rugifrons	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	*												
sculpturatus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	*						
nudatus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
peregrinus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
vestitus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
sævissimus	..	..	..	..	..	..	..	..	..	..	*	..	..	..	*	*												
Charaxus	..	..	..	..	..	..	..	..	..	..	..	*																
Busiris	..	..	..	..	..	..	..	..	..	..	*	*	..	..	*	*												
Acantha	..	..	..	..	..	..	..	..	..	..	*	*																
Merops	..	..	..	..	..	..	..	..	..	..	..	*																
Ithonus	..	..	..	..	..	..	..	..	..	..	*	*	*	*														
Eudora	..	..	..	..	..	..	..	..	..	..	..	*																
Metella	..	..	..	..	..	..	..	..	..	..	..	..	*	*														
Atropos	..	..	..	..	..	..	..	..	..	..	..	..	*	*														
Acasta	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	*									
Alphenus	..	..	..	..	..	..	..	..	..	..	..	*																
Labella	..	..	..	..	..	..	..	..	..	..	..	*																

	China.	India.	Philippines.	Malacca.	Borneo.	Singapore.	Gilolo.	Ternate.	Sumatra.	Java.	Waigiou.	Bachian.	Dory.	Mysol.	Celebes.	Ceram.	Amboyna.	Martabello.	Bouru.	Key.	Aru.	Timor.	Kaisaa.	Australia.	New Hebrides.	Madagascar.	Africa.	Europe.
olyrhachis																												
fervens	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*											
hastatus	..	*	..	..	..	..	..	..	..	..	..	..	..	..	*	..	*											
bicolor	..	..	..	..	..	..	..	*																				
Orsyllus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	*												
Mutilla	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Olenus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Democles	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Valerus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
trispinosus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Diaphantus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	*												
Amanus	..	..	..	..	..	..	.	..	..	..	..	..	..	..	*													
coleomanes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
exasperatus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Vibidia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Chaonia	..	..	..	..	..	..	*																					
Numeria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
hippomanes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Lycidas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Zopyrus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Eurytus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
Dolomedes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	*												
Trophimus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	*												
Alpheus	..	..	..	..	..	..	..	..			*																	
Bubastes	..	..	..	..	..	..	..	..			*																	
Paromalus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	*												
Xiphias	..	..	..	..	..	..	..	..			*																	
Eurydus	..	..	..	..	..	..	..	..			*																	
Derecynus	..	..	..	..	..	..	..	..			*																	
Sparaxes	..	..	..	..	..	..	..	..	..	..	..	..	..	*														
nigriceps	..	..	..	..	..	..	..	..			*																	
Paxillus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	.	..	..	..	*								
Echinopla																												
melanarctos	..	..	..	..	*	*	..	..	*																			
pallipes	..	..	..	..	*	*	..	..	..	..	..	..	..	..	*													
striata	..	..	..	*	*	..	..	..	*	..	..	..	..	..	*	*												
dubitata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	*												
nitida	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	*												
prætexta	..	..	..	..	..	..	..	..	..	..	..	..	*															
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flammulatum	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*													
orientale	..	..	..	..	..	*																						
Cryptocampus																												
nigripes	..	..	..	..	..	..	..	..	..	..	..	..	*															
Selandria																												
doryca	..	..	..	..	..	..	..	..	..	..	..	*	*															

	China.	India.	Philippines.	Malacca.	Borneo.	Singapore.	Gilolo.	Ternate.	Sumatra.	Java.	Waigiou.	Bachian.	Dory.	Mysol.	Celebes.	Ceram.	Amboyna.	Martabello.	Bouru.	Key.	Aru.	Timor.	Kaisaa.	Australia.	New Hebrides.	Madagascar.	Africa.	Europe.
Oryssus maculipennis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*							
Xyphidria rufipes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*							
lævipes.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*											
Tremex insignis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*							
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Notes on the Food and Parasites of the *Salmo salar* of the Tay. By W. CARMICHAEL M'INTOSH, M.D., F.L.S. Communicated by T. S. COBBOLD, M.D., F.L.S.

[Read Dec. 4, 1862.]

THE nature of the food of the *Salmo salar* has been variously estimated. Dr. Knox read a paper to the Linnean Society "On the Food of certain gregarious Fishes," including the Salmon, in which it is stated*, "From the time the salmon enters the fresh water, it ceases to feed, properly speaking, although it may occasionally rise to a fly, or be tempted to attack a worm or minnow, in accordance seemingly with its original habits as a smolt. But after first descending to the ocean and tasting its marine food, it never again resorts to its infantile food as a constant source of nourishment." He goes on to state that nothing whatever is found in the stomach or intestines of the fresh sea-salmon but a little reddish substance, which he found to be the ova of some species of Echinodermata, and affirms that such is the sole food of the salmon in the sea. He combats the views of M. Valenciennes, who describes the salmon as voracious and a devourer of fishes, and

* In abstract of paper, Annals of Nat. Hist., 2nd series, vol. xvi. p. 60.

maintains that there is not a single fact in the history of British salmon to support this opinion, and concluding thus :—"As to their feeding regularly in rivers, Mr. Young's experiments have negatived the assertion beyond all doubt." Yarrell gives the authority of Faber to support the assertion that it feeds on small fishes and various small marine animals; and Dr. Fleming says, "their favourite food in the sea is the sand-eel." Others confirm the latter statement, and add that within flood-mark some salmon have been taken with two, and some with three full-sized herrings in their stomachs.

In order to test the accuracy of the above conclusions with regard to the Tay, I examined the stomachs and intestines of upwards of a hundred salmon and grilse caught in the river from the commencement of the season in February to its ending in September of this year. The salmon in its young condition feeds freely enough; for the stomachs and intestines of the parr from Stormontfield ponds are gorged to an extreme degree with beetles, flies, larvæ, larvæ-tubes, and minute crustacea, while those of the smolts are also well filled. Indeed the voracity of young parr has cost them their lives in instances where they have been too freely fed with small flies. Such being the nature of the fish from its earliest age, one is sceptical at first sight in regard to the statement that the grilse and salmon do not feed in fresh water at all. Professor Owen* observes that the salmon, in common with many other fishes, when hooked or netted, empties its stomach by an instinctive act of fear, or to facilitate escape by lightening its load; so that the stomach, thus cleared of its contents, exhibits subsequently, for reward to the investigator, only the tiny animalcules, which, having been swallowed with more substantial fare, escaped ejection by lurking in the gastric mucus. Were such the case, an explanation would be readily given to the fact that the stomach of a fish which possesses so powerful a circulatory apparatus, and whose mucular tissues undergo a continual waste, should thus frequently be found empty. But if the salmon so fared, we should expect to find the intestines at least well filled with the débris of such food, since it cannot very easily vomit it after it has passed the pylorus; and the very terror which impels it to disgorge in one case may entirely paralyse its efforts to do so in another.

In its usual condition, the stomach is coated internally with a consistent white mucus of great tenacity, well calculated to hold

* Lect. on Comp. Anat.: Fishes, p. 237.

any "animalcules" introduced from without; yet in few or none did such occur, cellulo-granular matter and oil-globules alone appearing. In ten instances only did remnants of fishes occur, and in all these nothing remained but vertebral columns, cranial and other bones, with the denser tissues, as the lens, &c. The number of bones in several cases showed that the animals had enjoyed a most ample repast, since they belonged to fishes from 8 to 10 inches in length—of what species I have not been as yet able to determine. Some pieces of cartilage, skin, and pigment-cells seemed to belong to smelts, but most of the vertebræ belonged to larger fishes. The other kinds of food found in the stomach consisted of fragments of small freshwater crustacea with a portion of a shrimp in one or two fishes, and an occasional piece of insect-cuticle.

The duodenum is generally supplied in abundance with a less cohesive mucus of an orange tinge, and which is continued along the intestine. A constant accompaniment of this mucus in almost all fishes is a number of whitish or yellowish masses, extending far down the gut as a fragile knotted cord surrounded by the mucus—in some instances nearly to the anus. When a small portion of the white substance is put between glasses, it is gritty, and is found to consist of a vast number of calcareous crystals like those of the triple phosphate. They are quite unaffected by ether, but effervesce much and disappear on the addition of hydrochloric acid. Some of the larger crystals showed roughnesses on their surfaces, as if smaller crystals adhered or had adhered to form compound masses; others had a somewhat radiate arrangement of the constituent crystals. They occurred in all portions of the intestine from the pylorus downwards, but not in the pyloric cæca, and appeared in the fasting as well as in the full-fed fish. The mucus which more immediately surrounded them had a fibro-granular aspect. The exact origin of these crystals is an interesting question. So constantly were they present under all conditions as regards food, that they could not have been much influenced by the varying state of the latter. The intestinal surface being an eliminating as well as a secreting surface, we may conclude that these crystals had their origin in fluids produced by the mucous membrane. The skeleton of this fish being of small specific gravity and deficient in earthy matter, it may be that the excessive elimination of salts keeps down the specific gravity; or again, the circulating fluid by this means may so adapt the bones to the varying density of the salt and fresh water that their specific

gravity is in accordance with the medium. At any rate, and whatever be the explanation, the presence of these crystals is an interesting physiological fact. In a greater number of instances than in the case of the stomach, bones, lenses, and other dense textures occurred in the intestines; for they were present in several instances where no trace occurred in the former, and vertebræ could readily be detected as far down as the anus. In addition to those in which the débris of ascertained food in the stomach was found in the intestines, I met with crustacean hairs in several instances, Diatomaceæ, sand-particles, fragments of an insect, masses of solid fat, and portions of liver belonging to a fish like the Sparling. In every other instance there was nothing in the intestinal tract but parasites, mucus, crystals, and an abundant supply of fatty globules and particles of all sizes. The rapidity and power of digestion in this fish is extraordinary; but there is no doubt that, if the fish had fed regularly, the food could never have disappeared so rapidly and well as to defy even a microscopic investigation of the intestinal tract throughout. It is, however, a mistake to suppose that they never feed in fresh water at all, just as it is one to suppose that they feed voraciously, but vomit their food when captured. The true state of matters would seem to be that the salmon when in fresh water feeds rarely and at intervals, but not from want of voracity, as the contents of the stomachs above mentioned show; and further, that such food is occasionally found in its stomach from February till August *.

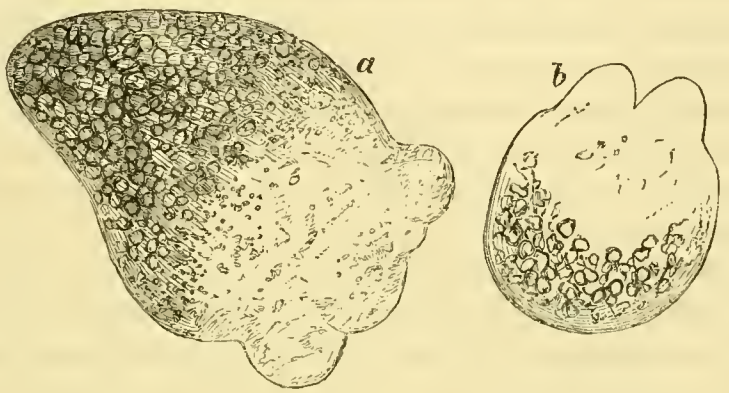
Ectozoa.—I had only the opportunity of examining about a dozen grilse and salmon for these parasitic animals, and the sole species found within the period above mentioned was *Lepeophtheirus Strömii* (Baird)—four males and three females. They occurred at the base of the fatty fin, at the base of the caudal rays, in the socket of the eye, and in front of the hyoid apparatus—and all in grilse.

Nothing whatever occurred on the branchiæ to attract attention but once; and this abnormal appearance proved to be non-parasitic. A number of large villi proceeded from a bulging and thickening of the arch, but solely attached to the cutaneous textures. The villi or processes were fibro-cellular in structure, and contained at their bases numerous black pigment-corpuscles and crystalline masses. They seemed to be morbid growths of the fibrous textures of the region.

* They have also been seen to void several vertebræ *per anum*, when landed on the bank of the river.

Entozoa.—If the search for food in the digestive system of the clean salmon and grilse was only rarely rewarded by success, certainly that for entozoa was more fortunate. There was scarcely a single fish which did not contain some of the following species, and many had them in abundance. The first of these I shall describe (fig. 1, *a*, *b*) is seldom or never absent throughout the entire

Fig. 1.



series of grilse and salmon. It is a minute creature, of gregariniform aspect, which squeezes its gelatinous body hither and thither amongst the granular débris and oil-globules of the duodenum and pyloric cæca. In its interior are numerous globules and granules, and a larger spherical body, which, when the animal is flattened between the glasses, gives it the aspect of having a sucker. One end is generally darker from the accumulation of the granular contents. Besides the shapes depicted in the drawing, this creature very often assumes an hourglass aspect from a central constriction. One of the chief habitats of this gregariniform animal is the pyloric cæca, where it has been found amongst the dry mucus even at the tip of one entirely blocked up by the coils of a *Bothriocephalus*. It is in all probability a stage in the development of some higher parasitic form.

Occurring in the greater number of the specimens of both grilse and salmon is *Distoma varicum* (Rud.), (*Fasciola varica* O. F. Müller, Zoologia Danica, p. 43, plate 72). Almost without exception, this species occurred in the stomach of the salmon, imbedded amongst the tenacious mucus, or else at the border of the latter at the commencement of the organ. They varied in number from one or two up to twenty-five or thirty in extreme cases, and they were also diversified as regards size. Müller in the above work observes that he met with five in the stomach of a salmon, and Rudolphi states that it is rare. This,

as above mentioned, is not the case with the salmon from the Tay, in which this parasite is rarely wanting. The description of the foregoing authors leaves little to be added, further than that Rudolphi is correct in stating that there is no anus as described by Müller. Detached and solitary ova frequently occurred in all portions of the intestine and cæca. In some specimens, bodies that seemed to be spermatozoa-cells were seen, in constant motion within tubes. When the Distomata are put into water, they wriggle and lengthen themselves, and the ventral disc may be seen occasionally tinged with blood. In the duodenum of one fish was a remarkable Distoma, which appeared rather to be two in congress, but yet may be a malformation, since one oral sucker only could be found, and each half differed somewhat from the body of an ordinary Distoma.

A single specimen only of another species of *Distoma* (*D. tereticolle*), of an elongated form, occurred in the intestine of a salmon.

In the œsophagus of a salmon a peculiar flask-shaped body was met with. It equalled in size a full-grown *Distoma varicum*, was of a yellow colour, and possessed two dark-brown patches, one at the broad end, and the other an elongated lateral one. The general body of the structure was filled with cells and granules, while the dark patches were made up of the dark-brown cells or masses, and some of the latter were of an elongated form. The contained pale cells and granules floated readily out through any fissure. Whether it is a parasitic structure pertaining to the salmon or some other fish I am unable to state, further than that it once occurred in the stomach of the former.

I found a single specimen of *Tetrarhynchus appendiculatus* (Rud.) when washing the mucous surface of the stomach of a salmon. On this there was a little eminence having a minute aperture at the summit, which when pressed gave exit to a small white body—after the manner of the parasites of the human skin, and the part extruded was the posterior elongated body shown in the figure *. When a section divided the eminence, the creature firmly adhered by its anterior hooks. On removal, it progressed leech-fashion by successive waves of its soft white body, adhering by either end at pleasure. The anterior or larger portion of the body was intensely white, the posterior appendage less so. When moving, its body assumed various shapes, now like a thick round jar, or again like an elongated flask, with numerous longitudinal striæ on its external surface. The body of the Tetrarhynchus was

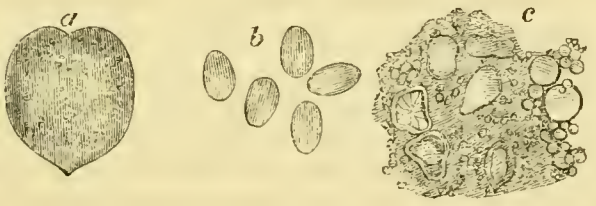
* Rudolphi, tab. 7. fig. 10.

enveloped in a tough white investment, and appeared one mass of cells of an elliptical form—some with and some without nuclei. Fibrous and muscular bands and peculiar tubes stretched backwards from the spinigerous columns. Some of the tubes were filled with cells; others, probably from bursting, were empty.

Anteriorly it was armed by the four formidable spinigerous processes capable of protrusion and retraction. Each consisted of an elongated and somewhat tapered stalk covered with a complete array of curved spines resembling on a miniature scale those on the rose, viz. with a broad base and strongly curved sharp point. They were regularly arranged on the column, and towards the base showed an interesting gradation into short, closely grouped blunt tubercles, not unlike the horny scales on the foot of a land tortoise. Below this the spinigerous column was marked by a constriction followed by a slight bulging, and ran inwards in the shape of a tubular process connected with a curved elongated sac. The sac was covered with an immense number of cross striæ as well as longitudinal furrows. From the opposite end of the sac, the tube was continued into the general body of the animal, and became filled with the oval cells and granular matter everywhere so prevalent. On the addition of acetic acid, immediate effervescence resulted in certain opaque and translucent masses in the interior of the animal; and the numerous cells formerly so conspicuous became transparent and indistinct, or were broken up into smaller cells.

Once afterwards the scolex of a species of *Tetrarhynchus* (fig. 2, *a*) occurred in the rectum of a salmon. It contained the usual

Fig. 2.



small, smooth, oval bodies or cells, quite pale and translucent (*b*). Under the action of dilute glycerine and pressure they assumed the shapes (*c*) along with some of the other contents of the scolex.

Three or four specimens of *Echinorhynchus inflatus* (Rud.) occurred in the intestines.

Only two specimens of *Echinorhynchus tereticollis* (Rud.)* oc-

* [This is *Echinorhynchus Proteus* of Dujardin, Von Siebold, and other modern authors. According to Prof. Rudolf Leuckart's very recent and extremely interesting discovery, this species undergoes a series of remarkable

curred—both in the small intestines. The more perfect one had its head retracted and quite loose. The entire animal was about half an inch in length. Continuous with the base of the proboscis was an elongated muscular structure, possessing many longitudinal striæ. Attached to this were many muscular bands slanting backwards. In the space behind the sac were also many cellular, granular, and crystalline masses. Rather behind the middle of the animal were two elliptical testes, granular and opaque. Posterior to these lay the ordinary granular and cellular structures, besides a convoluted tubular organ, at whose termination was an ovoid mass with a coiled aspect. This was succeeded by a peculiarly convoluted structure shaped somewhat like the semicircular canals of the internal ear, and followed posteriorly by a barred curved portion which lies a little in front of the termination of the animal*. The investing structure formed a thick layer, marked here and there by many mottled and shaded portions. When the hooks of the creature are fixed in the mucous membrane, it is impossible to remove them without tearing the texture therewith, as may be readily imagined from their form and direction.

Bothriocephalus proboscideus (Rud.) was the only species met with; but it occurred in by far the greater majority of the grilse and salmon, generally commencing with its coils in the duodenum and pyloric cæca, and stretching down the gut. The heads were generally met with in one of the cæca; and the appearance of the various specimens was very similar, except that some (probably owing to peculiarity of pressure) showed a greater bulging of the outline just behind the anterior end. The following may be given as

transformations in its passage from the embryonic to the adult condition,—the embryo bearing a relation to the fully-developed worm similar to that which *Pluteus* and *Pilidium* respectively bear to *Ophiurus* and *Nemertes*. Dr. Guido Wagener's previous investigations had led us to believe in a more simple and direct mode of development (Siebold and Kölliker's Zeitschrift, 1857, vol. ix. p. 77); but Leuckart fully establishes the fact of a true alternate generation in the life-history of *Echinorhynchus*. See his "Helminthologische Experimentaluntersuchungen" in Reports of Königl. Gesellschaft der Wissenschaft. for Oct. 22nd, 1862.—T. S. C.]

* [The author's description here evidently refers to the '*pavillon terminal*' of Dujardin, so efficiently described and figured by him in the 'Histoire Naturelle des Helminthes' as it occurs in the *Echinorhynchus Anthuris* of the newt. This copulatory apparatus of the male Echinorhynchus has since been noticed by several authors, whilst the female organs of reproduction have been carefully examined by ourselves (Linn. Trans. vol. xxii. p. 163), and especially also by Dr. Guido Wagener, whose descriptions appeared in the 9th volume of Siebold and Kölliker's Zeitschrift.—T. S. C.]

a good illustration. In a salmon of ten pounds, a Bothriocephalus lay coiled in the duodenum, and passing down to the small intestine filled it even to distention. The anterior portion proceeded into a cæcum by a double coil; from this, other four plies (two coils) entered another cæcum close by the pylorus, and performed many intricate bends therein, filling out the sac to a size equal to the similarly distended intestine of the fish. This cæcum contained the head, the distance of which from the truncated posterior extremity was 6 feet 6 inches. About 20 inches from the head a narrowing of the segments occurred, so as to resemble those near the head,—a not unfrequent occurrence. The size of the Bothriocephali did not always bear comparison with that of the fish.

Ascaris capsularia (Rud.).—This species is easily recognized by a whitish opaque portion a little behind the head. It is found on the liver, pyloric cæca, stomach, intestines, and gall-bladder at the attachment of the mesentery, &c. It is enveloped in a capsule of delicate fibrous tissue, in which it lies as a finger in a glove, —a circumstance which, from the attachment of the capsule to the surrounding textures by many delicate fibrous bands, renders it difficult to pull the creature off rudely or *en masse*, while it can readily be unhoused by drawing at its free end. These Ascari occur in most grilse and salmon; in fact, it is exceptional to find them absent. On the liver they are met with on all parts of the surface, coiled in a circular depression of its texture, but with a portion of the latter projecting in the centre. Most form this close coil, but others stretch in a long curve or semicircle. In the former the head is always external. On the cæca they are found amongst the fat, coiled after the fashion of a nummulite, and often surrounded by a deposit of pigment. Occasionally one had the anterior part of the body pushed into a cæcum, or, rarely, into the tissue of the liver. Once, on examining a small eminence on the inner surface of the stomach, a living *Ascaris capsularia* emerged on squeezing the perforated summit. Rarely one or two occurred in the interior of the stomach and intestines. Attached to the pyloric cæca, where these are so frequently found, curious structures which seemed degenerated Ascari were sometimes met with. A calcareous deposit filled part of the interior of one example.

Other forms of Ascarides * were present, some of which appeared referable to undescribed species. It may also be noted that in the stomach I once met with several small fibro-cartilaginous

* One species especially occurred very frequently.

tumours; and it is common to see a peculiar white appearance, often in rings, on the interior of the stomach. These portions are denser than the ordinary mucous surface, and often slightly elevated. Under the microscope they are fibro-granular. It is probable that they originate in some former parasitic inroads.

A succinct Review of recent Attempts to explain several remarkable Facts in the Physiology of Spiders and Insects.

By John Blackwall, F.L.S.

[Read April 2, 1863.]

My friend Mr. Meade, in his valuable report "On some Points in the Anatomy of the *Araneidea*, or true Spiders, especially on the internal structure of their Spinning Organs," * has been induced by his researches to adopt the opinion that these animals can propel from their spinners, to a considerable distance, fine lines formed of the viscid fluid secreted by appropriate organs situated in the interior of their abdomen. This hypothesis, based on zootomical considerations, being directly opposed to the conclusion arrived at by myself from numerous carefully conducted experiments, merits an impartial examination.

After having briefly stated the general results obtained by his dissection of several species of spiders, and minutely described the organization of the internal vessels that elaborate the material which, on issuing from the papillæ connected with the spinners, forms filaments of extreme tenuity, Mr. Meade remarks, "I have now arrived at the most interesting but most difficult part of my task, viz. the question whether there is anything in the structure of the silk-forming organs that will decide the question as to the power of spiders to eject their threads to a distance. Looking at the strong fibrous coat on the ducts of the membranous sacs, and the fibrous tissue surrounding the glands themselves, I think that they must possess a powerful contractile power, which may also be increased by the muscular coat of the integument enabling the spider to compress its abdomen. May not the striated bands of muscular fibres, which run in a parallel direction down the middle of the abdomen quite into the interior of the spinnerets, and surround the termination of the ducts, also assist in this object? They are not attached to the tegumentary coverings of the spinnerets like the other muscles, and cannot therefore be for the

* Report of the Twenty-eighth Meeting of the British Association for the Advancement of Science, p. 157.

purpose of moving these processes; their action must be to draw the spinnerets inwards." Such is the evidence supplied by dissection in support of the opinion that spiders can forcibly eject their lines to a distance.

Now it is manifest from well-known physiological facts that the muscles distributed to the spinning-organs perform various functions, the office of some being to give motion to those parts, of others to close either the minute aperture in the dilated base of the tubular papillæ, or that of the fine ducts which terminate the vessels that secrete the fluid employed by spiders in the process of spinning, as its issue from the papillæ can be instantaneously prevented at the will of the animals; others, moreover, must possess a contractile force sufficient to propel the fluid to the open extremity of the delicate hair-like papillæ, exactly as the non-viscid fluid, propelled by the contraction of the muscles connected with the vessel that secretes it, passes out of, but is not ejected in a stream from, the minute orifice situated near the extremity of the fang that terminates the falces.

To this extent I am prepared to admit the influence of the muscles that contribute directly or indirectly to the action of the spinning apparatus; but that a remarkably viscid fluid, which immediately becomes concrete on exposure to the air when drawn out in a filament of such marvellous tenuity as the lines produced by spiders, can, notwithstanding its extreme levity and flexibility, and quite irrespective of the size of the animals producing it, be propelled by any physical power with which they are endowed in a straight line of many feet in length, through a resisting medium liable to rapid fluctuations like the atmosphere, does appear to be in the highest degree improbable, and is, as already asserted, directly at variance with the result of an extensive and elaborate experimental investigation of the subject*, a brief abstract of which I proceed to give.

Spiders, if placed on wooden or metallic rods set upright in glass vessels with perpendicular sides, containing a sufficient quantity of clean water completely to immerse their bases, in vain attempt to effect an escape from them in a still atmosphere; all their efforts to accomplish the desired object, though perseveringly persisted in, proving quite unavailing when they are placed under a glass-shade, or in any situation where the air is not liable to be

* Transactions of the Linnean Society, vol. xv. p. 455; Researches in Zoology, pp. 242–248; A History of the Spiders of Great Britain and Ireland, part 1st, p. 12.

disturbed. However, should individuals thus insulated be exposed to a current of air, either naturally or artificially produced, they instantly turn the abdomen in the direction of the breeze, and emit from the spinners a little of their viscid secretion, which, being carried out in a line by the current, becomes connected with some object in the vicinity, and affords them the means of regaining their liberty. This line uniformly moves in the direction and with the velocity of the stream of air; but if, while proceeding from the spinners, it be subjected to the action of a lateral or opposing current, it immediately becomes deflected from its course by the new impulse thus imparted to it.

I may here remark that numerous species belonging to various genera of spiders,—*Drassus ater*, *Ciniflo similis*, *Ergatis latens*, *Tegenaria civilis*, *Cœlotes saxatilis*, *Dysdera erythrina*, and *Oonops pulcher*, for example,—though provided with highly organized spinners, yet do not appear to be endowed with the instinct to avail themselves of a current of air for the purpose of transmitting their lines to a distance.

The manner in which the lines of spiders are drawn out from the spinners by a current of air admits of an easy explanation. As a preparatory measure, the extremities of the spinners are brought into contact, and viscid matter is emitted from the papillæ; they are then separated by a lateral motion, which extends the viscid matter into filaments connecting the papillæ; on these filaments the current impinges, drawing them out to a length which is regulated by the will of the animal, and on the extremities of the spinners being again brought together, the filaments coalesce and form one compound line.

The only legitimate deduction from the foregoing experiments, which have been frequently repeated under every variety of circumstances likely to affect the result, appears to be that the lines produced by spiders are not propelled from the spinners by any physical power possessed by those animals, but that they are invariably drawn from them by the mechanical action of external forces.

§ 2.

The importance of the greatly diversified form of the remarkable organs connected with the radial and digital joints of the palpi of male spiders, in affording valuable specific characters in numerous cases in which species so closely resemble each other in size, colour, and economy as scarcely to be distinguished except by minute differences in their external structure, is beginning to

be duly appreciated by arachnologists, whose attention hitherto has been almost exclusively directed to investigations having for their object the discovery of the function performed by those organs—a highly interesting problem undoubtedly, the solution of which long continued to exercise the skill and ingenuity of zootomists and physiologists. Though the palpal appendages are now known to have a strictly sexual character, and have, in fact, been demonstrated by experiment to constitute a true intromittent organ absolutely essential to fecundation *, yet no direct communication has been ascertained to exist between them and certain vermicular vessels situated in the abdomen, and usually regarded as testes, whose ducts terminate in the space intermediate between the branchial stigmata. M. Dugès has attempted to obviate this difficulty by shrewdly suggesting that these parts may have been voluntarily brought together prior to the act of copulation, and then proceeds to ask, "le conjoncture" (palpal organ) "ferait-il alternativement l'office de siphon absorbant et d'organe éjaculateur?"—a question which he answers in the following terms :—"cela se peut, mais je n'ai rien pu observer, qui justifiât directement cette conjecture." †

In a concise notice of a work on the habits of the *Arachnida*, by A. Menge, given in the 'Reports on Zoology,' for 1843 & 1844, p. 195, published by the Ray Society, the following passage occurs :—"Copulation. It was reserved for the author to solve the physiological enigma which this act had hitherto presented. The spoon-shaped palpi of the males are in fact the copulative organs, with which they take the semen from the appropriate openings of the seminal ducts on the base of the abdomen, and transfer it to the sexual opening of the female. The procedure is carefully described in various Spiders." Not having had an opportunity of perusing the work of M. Menge, I am unable to state the particular observations which have led to a conclusion so precisely in accordance with the supposition previously entertained by M. Dugès.

This view of the subject I am incompetent either to confirm or refute, as in the course of extensive and minute investigations I have not succeeded in observing the act above described; and yet

* Researches in Zoology, pp. 295–298; Report of the Fourteenth Meeting of the British Association for the Advancement of Science, pp. 67–69.

† Annales des Sciences Naturelles, 2de série, Zoologie, tome vi. pp. 189, 190.

in numerous cases it ought to be very apparent, as the shortness of the palpi would render a strong inflection of the cephalothorax towards the inferior surface of the abdomen absolutely requisite before they could be applied to the part indicated as the seat of the seminal ducts.

I shall conclude these remarks with the statement of a few facts bearing upon the question, which have come to my knowledge in pursuing researches relative to the generation of Spiders.

In the act of copulation, the extremity of the organ of each palpus of the male, in a state of tumefaction, is usually introduced alternately into the vulva of the female, and that many times in succession, without being once brought into contact with any part of its own abdomen, though it is very frequently conveyed to the mouth; and I have observed a male *Lycosa lugubris* apply its right palpus eighty times, in the manner above described, to the vulva of a female (both of which had been placed in a clean glass phial), without the possibility of bringing it into contact with the inferior surface of its abdomen, except by a very conspicuous change of position; and as an equal number of similar acts were performed by the left palpus, we have the extraordinary fact of the palpal organs being employed 160 times during this greatly protracted process, unaccompanied by any contact whatever with the part where the seminal ducts are considered to terminate.

A male *Agelena labyrinthica*, confined in a phial, spun a small web, and among the lines of which it was composed I perceived that a drop of white milk-like fluid was suspended; how it had been deposited there I cannot explain, but I observed that the Spider, by the alternate application of its palpal organs, speedily imbibed the whole of it. Perhaps the only safe conclusion to be drawn from this very remarkable circumstance, taken in connexion with the previously well-ascertained office of these parts, is that it affords a complete answer in the affirmative to the question asked by M. Dugès, namely, "le conjoncture ferait-il alternativement l'office de siphon absorbant et d'organe éjaculateur?"

§ 3.

My explanation of the means whereby various animals are supported in their movements on the vertical surfaces of highly-polished bodies having recently been called in question, I am induced to offer a few remarks in vindication of its accuracy.

Mr. Tuffen West, in treating "On certain Appendages to the

Feet of Insects subservient to Holding or Climbing"* advocates the hypothesis that the papillæ distributed over the inferior surface of the pulvilli of flies and other species of the class *Insecta* act separately as independent suckers, adhesion being assisted by the emission from each of a small quantity of fluid. This view of the subject, being absolutely irreconcilable with the results of observations and experiments regarded as having established a widely different conclusion, I am not prepared to adopt. That fluid is emitted from the papillæ connected with the pulvilli of the House-fly and Flesh-fly when in motion is unquestionable, as finely pulverized nitrate of silver brought into contact with those parts is immediately acted upon by it; but that its agency is merely to effect a more complete vacuum between the climbing apparatus and the plane of position is evidently inadmissible. This fluid, which appears to possess a moderate degree of viscidity, assumes a gelatinous consistency when coagulated by exposure to the atmosphere, and by its adhesive property enables animals provided with the requisite organs to move with facility and security on the vertical surfaces of dry, highly polished bodies. In confirmation of the explanation of the phenomenon here insisted on, many facts might be advanced; but it will suffice, in the present instance, to direct attention to one, the decisive character of which cannot be mistaken.

That flies are not supported on the vertical sides of highly polished bodies by the pressure of the atmosphere, experiments with the air-pump plainly demonstrate; for they can not only traverse the upright sides and the interior of the dome of an exhausted receiver, while their physical energy is unimpaired, but individuals occasionally remain fixed to the sides of the glass after they have entirely lost the power of locomotion—a circumstance which can only be explained by admitting the adhesive property of the fluid emitted from the extremity of the papillæ on the inferior surface of their pulvilli.

To the same cause must also be attributed the power of Spiders that are provided with scopulæ or tarsal brushes to run with celerity on the vertical surfaces of highly polished bodies, as those instruments consist of numerous appendages slightly curved downwards and somewhat enlarged towards their extremity, which is densely covered on its inferior surface with minute hair-like papillæ for the emission of a viscid fluid, but which, from

* Journal of the Proceedings of the Linnean Society, vol. vi. p. 26.

their organization, cannot possibly contribute to the formation of a vacuum.

The foregoing solution of this interesting physiological problem, I have reason to believe is applicable not to insects and Spiders alone, but also to some species of reptiles.

Catalogue of the Heterocerous Lepidopterous Insects collected at Sarawak, in Borneo, by Mr. A. R. Wallace, with Descriptions of New Species. By Francis Walker, Esq., F.L.S.

[Continued from p. 84.]

Gen. Artigisa, n. g.

Mas. *Corpus* vix robustum. *Proboscis* conspicua. *Palpi* subarcuati, verticem paullo superantes; articulus 3us lanceolatus, 2° brevior. *Antennæ* setis longiusculis instructæ. *Abdomen* alas posticas non superans; fasciculus apicalis parvus, compressus. *Pedes* robusti, pilosi, femoribus tibiisque anticis dense pilosis, calcaribus longis. *Alæ* anticæ apice subrotundatæ, costa recta, margine exteriore vix convexo sat obliquo.

Male. Body hardly stout. Proboscis distinct. Palpi slightly curved, rising a little higher than the vertex; 3rd joint lanceolate, much shorter than the 2nd. Antennæ with rather long bristles. Abdomen not extending beyond the hind wings; apical tuft small, compressed. Legs stout, pilose; fore femora and fore tibiæ densely pilose; hind tibiæ with four long spurs. Wings moderately broad. Fore wings slightly rounded at the tips; costa straight; exterior border hardly convex, rather oblique.

354. Artigisa nigrosignata, n. s. *Mas.* Ochraceo-cinerea, alis fascia media e atomis nigris, lineis exteriore et submarginali undulatis lunulisque marginalibus nigris, alis anticis lituris costalibus, plaga basali fasciaque exteriore nigris.

Male. Cinereous, tinged with dull ochraceous, paler beneath. Fore legs partly black. Wings with a few black speckles, which form a very incomplete middle band; exterior line black, slender, distinct, undulating, bent in the fore wings; submarginal line undulating, much less distinct; submarginal lunules black, forming a festoon with the marginal line. Fore wings with black marks along the costa, and with a black basal patch formed of confluent speckles; a black band, broadest by the costa, partly contiguous to the outer side of the exterior line, and traversing the submarginal line; this band is diffuse hindward, and emits a diffuse streak from its exterior side. Length of the body 4 lines; of the wings 10 lines.

Gen. Veia, n. g.

Mas. *Corpus* vix robustum. *Proboscis* conspicua. *Palpi* compressi,

verticem superantes; articulus 2us latissime fimbriatus; 3us minimus. *Antennæ* latissime pectinatæ, apices versus simplices. *Abdomen* cristatum, alas posticas perpaullo superans. *Pedes* sat graciles, femoribus tibiisque posterioribus subfimbriatis, calcaribus longissimis. *Alæ* anticæ elongatæ, apice rotundatæ, costa recta.

Male. Body hardly stout. Proboscis distinct. Palpi compressed, rising rather higher than the vertex; 2nd joint very broadly fringed; 3rd very small. Antennæ very broadly pectinated to beyond half the length, bare from thence to the tips. Abdomen crested, extending very little beyond the hind wings. Legs rather slender; posterior femora and tibiæ slightly fringed; hind tibiæ with four very long spurs. Wings elongate, moderately broad. Fore wings rounded at the tips; costa straight; exterior border very oblique, very slightly convex.

355. Veia homopteroides, n. s. *Mas.* Ferrugineo-fusca, cinereo suffusa, alis lineis plurimis denticulatis punctisque marginalibus nigris, fasciis duabus cinereis.

Male. Ferruginous brown, with a cinereous tinge, more cinereous beneath. Wings with several denticulated oblique slight black lines and with black marginal points; two cinereous bands, one exterior, the other marginal and less distinct. Length of the body 5 lines; of the wings 14 lines.

Fam. HYPOGRAMMIDÆ, *Guén.*

Gen. Briarda, *Walk.*

356. Briarda decens, *Walk. Cat. Lep.* 3rd ser. 1098.
Inhabits also Hindostan.

Gen. Gadirtha, *Walk.*

357. Gadirtha inexacta, *Walk. Cat. Lep.* 3rd ser. 1102.
Inhabits also Hindostan.

358. Gadirtha chalybea, n. s. *Fœm.* Obscure ferrugineo-fusca, abdomine subcristato alas posticas paullo superante, alis anticis chalybeo tinctis, lineis nonnullis denticulatis lunulisque marginalibus nigris, striga basali testacea, alis posticis cupreo-fuscis.

Female. Dark ferruginous brown. Third joint of the palpi linear, shorter and more slender than the 2nd. Abdomen with slight crests, extending a little beyond the hind wings. Fore wings with a chalybeous tinge and with several transverse black denticulated lines, between some of which the ground-hue is rather paler than it is elsewhere; a testaceous basal streak dilated at the base, near which it is interrupted; marginal lunules black. Hind wings cupreous brown. Length of the body 8 lines; of the wings 20 lines.

359. Gadirtha diffundens, n. s. *Fœm.* Obscure fusca, palpis ru-

fescentibus, abdomine basi cinereo, alis æneo-fuscis, anticis apice rotundatis, vitta costaque nigro-purpureis, lineis quatuor undulatis indistinctis obscure fuscis, puncto basali punctoque discali ochraceis, linea submarginali cervina.

Female. Dark brown. Palpi reddish, obliquely ascending; 3rd joint lanceolate, about half the length of the 2nd. Abdomen cinereous towards the base, extending somewhat beyond the hind wings. Legs rather short and stout. Wings rather narrow, æneous brown. Fore wings rounded at the tips, blackish purple along the costa and along the interior border, and with a middle stripe of the same hue; four oblique, undulating, indistinct, dark brown lines; an ochraceous point in the disk near the base, and another representing the reniform mark; submarginal line fawn-colour, irregular, most distinct in front; costa straight; exterior border convex, very oblique. Length of the body 7 lines; of the wings 16 lines.

360. GADIRTHA POLYGRAPHA, n. s. *Fœm.* Obscure ferrugineo-fusca, abdomine alas posticas vix superante, alis anticis longis sat latis cinereo subtinctis apice subrotundatis, fasciis duabus nigris abbreviatis, lineis interioribus undulatis subdentatis lineisque exterioribus cuneatis nigris, alis posticis fuscis.

Female. Very dark ferruginous brown, slightly paler beneath. Third joint of the palpi much shorter than the 2nd. Abdomen hardly extending beyond the hind wings. Wings long, rather broad. Fore wings partly tinged with cinereous, slightly rounded at the tips; interior part with some black undulating and slightly dentate lines; exterior part with several black cuneiform lines; two interior black bands, much abbreviated towards the interior border; 2nd band terminating in an elongated whitish dot; marginal lunules black; costa very slightly convex. Hind wings brown; fringe with the tip cinereous. Length of the body 8 lines; of the wings 21 lines.

361. GADIRTHA FERROMIXTA, n. s. *Mas.* Rufescenti-ferruginea, thorace nigro cinereoque consperso, alis anticis subdentatis sat angustis vix acutis, fasciis cinereis ex parte nigro marginatis lineas ferrugineas undulatas includentibus, striga costali subapicali lunulisque marginalibus nigris, alis posticis obscure cinereis.

Male. Reddish ferruginous, cinereous beneath. Palpi porrect; 3rd joint much shorter than the 2nd. Antennæ setulose. Thorax with black and cinereous speckles. Abdomen cinereous. Tibiæ banded with black. Wings slightly dentate, rather narrow. Fore wings hardly acute, with some irregular cinereous iridescent partly black-bordered bands, which include some ferruginous undulating lines; a longitudinal black streak near the tip of the costa; marginal lunules black. Hind wings dark cinereous. Length of the body 7 lines; of the wings 18 lines.

362. GADIRTHA QUADRINOTATA, n. s. *Fœm.* Obscure ferrugineo-fusca, abdomine alas posticas perpaullo superante, alis anticis latius-

culis vix dentatis, lineis nonnullis denticulatis pallide cervinis nigricante marginatis, spatio medio purpurascente maculam nigram includente, alis posticis obscure fuscis.

Female. Dark ferruginous brown, cinereous brown beneath. Palpi rather slender, not rising higher than the vertex; 3rd joint a little less than half the length of the 2nd. Abdomen extending very little beyond the hind wings. Wings hardly dentate, rather broad. Fore wings hardly acute, with several denticulated pale fawn-coloured blackish-bordered lines; middle part purplish-tinged, including a black discal hindward spot; some whitish costal subapical points; marginal lunules elongated, dark brown. Hind wings dark brown. Length of the body $4\frac{1}{2}$ lines; of the wings 12 lines.

363. Gadirtha metaphæa, n. s. *Fœm.* Ochraceo-ferruginea, alis anticis elongatis apice subrotundatis, lineis nonnullis testaceis dentatis nigro punctatis, striga basali postica lata fusca, fimbria testacea nigro notata, alis posticis nigro-fuscis, fimbria extus cinerea.

Female. Ochraceous ferruginous. Body pale beneath. Third joint of the palpi full half the length of the 2nd. Abdomen cinereous. Wings elongate. Fore wings slightly rounded at the tips, with several testaceous dentate transverse lines, some of whose angles are pointed with black; interior border with a short broad brown streak at the base; fringe testaceous, with black marks. Hind wings blackish brown; fringe cinereous exteriorly. Length of the body 7 lines; of the wings 16 lines.

364. Gadirtha? semifervens, n. s. *Fœm.* Pallide straminea, abdomine alas posticas paullo superante, alis anticis vix acutis nigro subconspersis, lineis duabus cervinis undulatis non obliquis, puncto basali, punctis duobus discalibus lineaque submarginali punctulari nigris, costa convexa, alis posticis extus rufescentibus.

Female. Pale straw-colour. Palpi rising higher than the vertex; 3rd joint lanceolate, about half the length of the second. Abdomen extending a little beyond the hind wings. Hind tibiæ with four very long spurs. Wings moderately broad, with blackish marginal points. Fore wings hardly acute, thinly and minutely black-speckled; interior and exterior lines fawn-coloured, undulating, not oblique; submarginal line composed of black points; a black basal point and two black discal points; costa convex; exterior border moderately oblique; under side reddish. Hind wings reddish above exteriorly. Length of the body 5 lines; of the wings 13 lines.

365. Gadirtha? discigera, n. s. Cervina, alis anticis rufescente tinctis, apice subrotundatis, linea interiore indistincta, striga discali, linea exteriore arcuata cinereo marginata lineaque submarginali interrupta nigris, costa vix convexa, alis posticis cinereis.

Fawn-colour, cinereous beneath. Fore wings reddish-tinged, slightly rounded at the tips, with a black discal streak, beyond which there is a black much outward-curved line, which is bordered with cinereous

on the outer side, and has between it and the exterior border a black submarginal very incomplete line; interior line black, denticulated, indistinct; costa hardly convex; exterior border slightly convex, very oblique. Hind wings cinereous. Length of the body 5?; of the wings 14 lines.

Gen. Phumana, n. g.

Fœm. Corpus crassum. *Proboscis* brevis. *Antennæ* validæ, simplices. *Abdomen* convexum, alas posticas longe superans. *Pedes* breves, robusti, femoribus tibiisque posticis densissime pilosis. *Alæ* elongatæ, sat angustæ; anticæ apice rotundatæ, costa recta, margine exteriore convexo.

Female. Body thick. Proboscis short. Antennæ stout, simple. Abdomen convex, slightly tapering from the base to the tip, extending far beyond the hind wings. Legs short, stout; hind femora and hind tibiæ most densely clothed with long hairs; hind tibiæ with four stout spurs. Wings elongate, rather narrow. Fore wings rounded at the tips; costa straight; exterior border convex, moderately oblique.

Allied to *Gadirtha*.

366. Phumana canescens, n. s. *Fœm.* Cinerea, thorace fascia ferruginea, alis anticis fusco conspersis et nebulosis, lineis cinereis denticulatis, litura reniformi ferrugineo-rufa subrotunda nigro punctata, punctis duobus basalibus nigris, litura basali postica ferrugineo-rufa, alis posticis cinereo-fuscis, spatio marginali ferrugineo-rufescente.

Female. Cinereous, darker beneath. Thorax with a ferruginous band in front. Fore wings minutely brown-speckled, partly shaded with brown, the latter hue with denticulated transverse cinereous lines; reniform mark ferruginous red, nearly round, with a black point; two other black points in the disk nearer the base; a ferruginous-red mark by the base of the interior border, and a tinge of the same hue along the costa; marginal line brown, zigzag. Hind wings cinereous brown, with a ferruginous-red tinge about the middle part of the exterior border. Length of the body 7½ lines; of the wings 16 lines.

Gen. Chuduca, n. g.

Fœm. Corpus sat robustum. *Proboscis* brevis. *Palpi* decumbentes, compressi; articulus 2us apice latior; 3us parvus. *Antennæ* glabræ, graciles. *Abdomen* alas posticas paullo superans. *Pedes* sat validi; tibiæ posticæ calcari apicali longissimo. *Alæ* anticæ elongatæ, angustæ, acutæ, costa vix convexa, margine exteriore subconvexo perobliquo.

Female. Body moderately stout. Proboscis short. Palpi decumbent, compressed, not longer than the breadth of the head; 2nd joint widened towards the tip; 3rd conical, minute, less than one-fourth of the length of the 2nd. Antennæ smooth, slender. Abdomen extending a little beyond the hind wings. Legs moderately long, and stout hind tibiæ with four spurs; one of the apical pair very long.

Wings elongate. Fore wings narrow, acute; costa hardly convex; exterior border slightly convex, extremely oblique. Hind wings moderately broad.

Allied to *Gadirtha*.

367. Chuduca pyraloides, n. s. *Fœm.* Nigricans, alis anticis chalybeo subtinctis plaga apud marginem interiorem pallida nigro conspersa, lineis nigris denticulatis valde indistinctis, punctis basalibus testaceis, linea duplici marginali e punctis albis, alis posticis æneo-fuscis basi cinereis subhyalinis.

Female. Blackish. Abdomen and underside dark cinereous. Fore wings slightly tinged with chalybeous blue; a pale black-speckled patch by the interior border; transverse lines black, denticulated, very indistinct; a few testaceous points in the disk towards the base, and a double row of white points along the exterior border. Hind wings æneous brown, cinereous and slightly hyaline towards the base. Length of the body 5 lines; of the wings 14 lines.

Gen. Ciasa, n. g.

Fœm. Corpus sat robustum. *Proboscis* conspicua. *Palpi* porrecti, compressi; articulus 2us pilosus; 3us lanceolatus, 2^{i} dimidio non longior. *Antennæ* graciles, glabræ. *Abdomen* lanceolatum, alas posticas perpaullo superans, basi subcristatum. *Pedes* læves, sat validi; tibiæ posticæ calcaribus longis. *Alæ* longiusculæ; anticæ acutæ, costa recta, margine exteriore perobliquo.

Female. Body moderately stout. Proboscis distinct. Palpi porrect, compressed, about as long as the breadth of the head; 2nd joint pilose; 3rd lanceolate, about half the length of the 2nd. Antennæ slender, bare. Abdomen lanceolate, extending very little beyond the hind wings, slightly crested towards the base. Legs smooth, moderately long and stout; hind tibiæ with four long spurs. Wings rather long, moderately broad. Fore wings acute; costa straight; exterior border very oblique.

Allied to *Gardirtha*.

368. Ciasa pustulifera, n. s. *Fœm.* Ferrugineo-fusca, alis anticis lituris tribus discalibus pallide viridescentibus, lineis nigris dentatis interruptis pallido marginatis, striga obliqua marginali pallide cervina, lunulis marginalibus nigris pallido marginatis, fimbria cinerea pallido notata, alis posticis æneo-fuscis.

Female. Ferruginous brown. Abdomen and underside cinereous brown. Fore wings with three pale dull greenish marks in the disk, and with some black, pale-bordered, dentate, irregular, and interrupted lines; an oblique pale fawn-coloured streak by the fore part of the exterior border; marginal lunules black, pale-bordered; fringe dark cinereous, with pale marks; costa with four pale points towards the tip. Hind wings æneous brown; fringe tipped with hoary. Length of the body 5 lines; of the wings 12 lines.

Gen. Corsa, *Walk.*

369. Corsa absorbens, n. s. *Fœm.* Fusca, alis anticis cervinis albido marginatis, basi, plaga apud angulum interiorem plagaque apicali fuscis nigro conspersis, linea submarginali cana dentata, alis posticis fimbria cinerea.

Female. Brown. Palpi obliquely ascending; 3rd joint less than half the length of the 2nd, with which it forms a slight angle. Fore wings fawn-colour, whitish-bordered with the exception of the base, an apical patch, and a patch by the interior angle; these are brown, speckled with black, and the two patches contain a submarginal dentate hoary line; tips rounded; exterior border convex. Hind wings brown, with a fawn-coloured border; fringe cinereous. Length of the body 6 lines; of the wings 16 lines.

Gen. Curgia, n. g.

Mas. Corpus crassum. *Proboscis* conspicua. *Palpi* validi, pilosi, recurvi, verticem superantes; articulus 3us lanceolatus, 2° brevior. *Antennæ* subsetulosæ. *Abdomen* alas posticas longe superans. *Pedes* breves, robusti, pilosi; tibiæ posticæ calcaribus quatuor longis. *Alæ* anticæ breviusculæ, sat angustæ, apice subrotundatæ, costa margineque exteriore rectis.

Male. Body very stout. Proboscis moderately long. Palpi stout, pilose, applied to the front, recurved over the vertex; 3rd joint lanceolate, shorter than the 2nd. Antennæ very minutely setulose. Abdomen extending much beyond the hind wings. Legs short, stout, pilose; hind tibiæ with four long spurs. Wings rather short. Fore wings rather narrow, slightly rounded at the tips; costa and exterior border straight, the latter rather oblique. Hind wings moderately broad.

Allied to *Plotheia.*

370. Curgia nonagrica, n. s. *Mas.* Testacea, thorace antico fuscescente, alis anticis linea exteriore albida subobliqua vix undulata intus nigro punctata, reniformi angusta indistincta nigricante marginata, alis posticis cinereis semihyalinis.

Male. Testaceous. Thorax brownish in front. Abdomen and under side pale cinereous. Fore wings with a whitish exterior, slightly oblique, hardly undulating line, which is accompanied by black points on its inner side; reniform mark narrow, blackish-bordered, indistinct; marginal points black. Hind wings cinereous, semihyaline, slightly iridescent. Length of the body 8 lines; of the wings 16 lines.

Gen. Cropia, *Walk.*

371. Cropia onerata, n. s. *Mas.* Nigra, crassa, subtus albida, abdomine fusco-cinereo basi cristato apice nigro alboque cincto late-

ribus albo punctatis, alis anticis purpureo-rufescentibus latiusculis subdentatis, lineis undulatis nigris, spatio marginali glauco-cinereo lineam nigram denticulatam includente, puncto maculaque exteriore discalibus nigris, plaga subcostali squamosa iridescente, alis posticis glauco-cinereis, plaga exteriore squamosa.

Male. Black, very stout, whitish beneath. Palpi white in front, ascending higher than the vertex; 3rd joint shorter than the 2nd. Antennæ stout, minutely setulose. Thorax slightly speckled with cinereous. Abdomen brownish cinereous, extending a little beyond the hind wings, crested towards the base, with a transverse black-and-white line at the base of the tuft, which is reddish; a row of white points along each side. Wings rather broad, slightly dentate, cinereous beneath. Fore wings of a various purplish-reddish hue, with undulating black lines, which are here and there dilated; marginal space glaucous cinereous, intersected by a black denticulated line; an incomplete row of yellow black-bordered marginal points; a black discal point, and an exterior black discal spot; a curved pale line forming a loop with the costa, which has pale points along its exterior parts; a large squamous iridescent subcostal patch. Hind wings glaucous cinereous, with a short black reddish-bordered line, which extends from the interior border to the disk; a patch like that of the fore wings, but narrower and extending from the disk to the fore part of the exterior border; fringe brown, interlined with black, white at each end; under side with a line composed of black dots. Length of the body 10 lines; of the wings 20 lines.

This species has some resemblance to *Hypoetra complens*.

Gen. Asinduma, n. g.

Fœm. Corpus robustum, squamosum, læve. *Proboscis* conspicua. *Palpi* compressi, vix lati, verticem paullo superantes; articulus 3us lanceolatus, 2° brevior. *Antennæ* graciles. *Abdomen* subcarinatum, alas posticas perpaullo superans. *Pedes* validi, læves; tibiæ posticæ quadricalcaratæ. *Alæ* anticæ apice rotundatæ, costa basi subconvexa, margine exteriore subconvexo.

Female. Body stout, squamous, smooth. Proboscis distinct. Palpi compressed, hardly broad, ascending a little higher than the vertex; 3rd joint lanceolate, much shorter than the 2nd. Antennæ slender. Abdomen slightly keeled, extending very little beyond the hind wings. Legs stout, smooth; hind tibiæ with four spurs of moderate length. Wings moderately broad. Fore wings rounded at the tips; costa very slightly convex towards the base; exterior border very slightly convex and oblique.

This genus has some affinity to the *Acontidæ*.

372. Asinduma exscripta, n. s. *Fœm.* Pallide lutea, palpis extus fuscescentibus, abdomine fusco-cinereo, alis anticis albidis, costa lineis

que undulatis lutescentibus, puncto discali nigro, linea exteriore fusca arcuata extus pallido intus plumbeo marginata, spatio marginali fuscescente lineam pallidam angulosam nigricante marginatam includente, alis posticis cupreo-fuscis.

Female. Dull pale luteous, whitish beneath. Palpi brownish exteriorly. Abdomen brownish cinereous. Fore wings whitish, lutescent along the costa, and with lutescent transverse undulating lines; a black discal point and a brown curved exterior line, which is pale-bordered on the outer side and broadly bordered with plumbeous on the inner side; space beyond the line brownish, including a pale blackish-bordered very zigzag submarginal line. Hind wings cupreous brown. Length of the body 4½ lines; of the wings 11 lines.

Gen. Carissa, n. g.

Mas. Corpus robustum. *Proboscis* brevis. *Palpi* oblique ascendentes, verticem longe superantes; articulus 3us linearis, 2o paullo brevior et gracilior. *Antennæ* longæ, validæ, setulosæ, pubescentes. *Abdomen* subcompressum, alas posticas sat superans; fasciculus apicalis minimus. *Pedes* vix robusti; tibiæ intermediæ pilis longissimis fimbriatæ; tibiæ posticæ subfimbriatæ. *Alæ* elongatæ; anticæ apice rotundatæ, costa recta, margine exteriore perobliquo.

Male. Body stout. Proboscis short. Palpi obliquely ascending, rising much higher than the vertex; 3rd joint linear, a little shorter and more slender than the 2nd. Antennæ long, stout, setulose, pubescent. Abdomen tapering, slightly compressed, extending rather far beyond the hind wings; apical tuft very small. Legs hardly stout; middle tibiæ thickly fringed along the whole length with extremely long hairs; hind tibiæ slightly fringed with short hairs; spurs of moderate length. Wings elongate, moderately broad. Fore wings rounded at the tips; costa straight; exterior border convex, very oblique.

373. Carissa cossoides, n. s. *Mas.* Obscure fusca, alis anticis nigro strigatis, plagis duabus purpureo-nigris atro marginatis, 1a basali, 2a exteriore.

Male. Dark brown. Abdomen, underside, and wings brownish cinereous. Fore wings with minute transverse black streaks, and with two large purplish-black patches, one near the base, the other exterior, both bordered hindward by a deep-black line. Length of the body 8 lines; of the wings 18 lines.

Gen. Maxilua, n. g.

Fœm. Corpus robustum. *Proboscis* conspicua. *Palpi* sat graciles, verticem superantes; articulus 2us subarcuatus; 3us linearis, brevior. *Abdomen* alas posticas non superans. *Pedes* validi; tibiæ fimbriatæ. *Alæ* anticæ apice rectangulatæ, costa recta, margine exteriore subconvexo.

Female. Body stout. Proboscis distinct. Palpi rather slender, rising higher than the vertex; 2nd joint slightly curved; 3rd linear, much shorter than the 2nd. Abdomen not extending beyond the hind wings. Legs stout; tibiæ fringed; hind tibiæ with four spurs of moderate length. Wings moderately broad. Fore wings rectangular at the tips; costa straight; exterior border slightly convex and oblique.

374. Maxilua frontalis, n. s. *Fœm.* Cinerea, subtus obscure fusca, capite thoraceque antico pallide ochraceis, fronte palpisque obscure fuscis, alis anticis purpureo æneoque nitentibus, lineis tribus fuscis indistinctis subundulatis, alis posticis cupreo-fuscis.

Female. Cinereous, dark brown beneath. Head and fore part of the thorax pale ochraceous; front and palpi dark brown. Wings beneath with one exterior brown line. Fore wings with purple and æneous reflexions, and with three brown indistinct slightly undulating lines; 2nd line accompanied by a darker brown dot; marginal points black. Hind wings cupreous brown; under side with a brown discal dot Length of the body 6 lines; of the wings 14 lines.

Gen. Thacona, n. g.

Mas. Corpus vix robustum. *Proboscis* conspicua. *Palpi* breves, validi, oblique ascendentes; articulus 2us arcuatus, latus; 3us brevissimus. *Antennæ* longæ, subserratæ, pubescentes. *Abdomen* cylindricum, longissimum. *Pedes* longiusculi, sat graciles; tibiæ anticæ breves; tibiæ posticæ calcaribus duobus apicalibus, uno longissimo; tarsi postici longissimi. *Alæ* anticæ longæ, angustæ, apice rotundatæ; posticæ amplæ.

Male. Body hardly stout. Proboscis distinct. Palpi short, stout, obliquely ascending, applied to the head; 2nd joint curved, broad; 3rd extremely short and minute. Antennæ long, minutely serrated, very pubescent. Abdomen cylindrical, very long, extending far beyond the hind wings; apical tuft divergent. Legs rather long and slender; fore tibiæ short; hind tibiæ with two apical spurs, one of which is very short; tarsi long; hind tarsi very long. Wings long. Fore wings narrow, rounded at the tips; costa straight; exterior border convex, moderately oblique. Hind wings ample.

This is a very aberrant genus, and does not accord well with the characters of any of the families of the *Noctuites*.

375. Thacona costivitta, n. s. *Mas.* Albida, capite thoraceque antico ferrugineis, abdomine alisque posticis fusco-cinereis æneo tinctis, alis anticis vitta costali ferruginea nigro notata postice dilatata et maculam albidam includente.

Male. Head and fore part of the thorax ferruginous. Thorax whitish hindward. Abdomen and hind wings brownish cinereous, with an æneous tinge. Underside of the body and of the wings cinereous

brown. Fore wings whitish, with a ferruginous costal stripe, which contains some black marks, and is notched along its hind side; the latter dilated in the middle, and containing an oblong whitish spot. Length of the body 9 lines; of the wings 20 lines.

Gen. Badausa, n. g.

Fœm. *Corpus* robustum. *Proboscis* conspicua. *Palpi* graciles, oblique ascendentes, valde compressi; articulus 3_{us} lanceolatus, 2^{i} dimidio brevior. *Antennæ* subpubescentes. *Abdomen* alas posticas non superans. *Pedes* sat robusti; tibiæ posticæ pilosæ, calcaribus quatuor longissimis. *Alæ* anticæ latæ, apice rectangulatæ.

Female. Body stout. Frontal tuft prominent. Proboscis distinct. Palpi slender, obliquely ascending, extremely compressed; 3rd joint lanceolate, less than half the length of the 2nd. Antennæ very minutely pubescent. Abdomen not extending beyond the hind wings. Legs somewhat stout; hind tibiæ pilose, with four very long spurs. Wings broad. Fore wings rectangular at the tips; costa straight; exterior border oblique hindward.

This genus hardly forms part of the family with which it is here placed, and perhaps it is not one of the *Noctuites*; it has some affinity to the *Hypenidæ*.

376. Badausa hypenoides, n. s. *Fœm.* Obscure ferrugineo-fusca, abdomine alisque posticis æneo-fuscis, alis anticis spatio marginali cinereo lineam albidam angulosam includente, lineis duabus nigris, 1^{a} undulata, 2^{a} postice abbreviata, puncto discali nigro.

Female. Dark ferruginous brown, cinereous brown beneath. Abdomen and hind wings æneous brown. Fore wings with a large cinereous space along the border on each side of the interior angle, and including a whitish zigzag submarginal line; interior and exterior lines black, the former undulating, the latter shortened hindward by the cinereous part; a black discal point between the lines; submarginal line obsolete in front, except near the costa, where it is white and distinct. Length of the body 6 lines; of the wings 16 lines.

Gen. Asta, n. g.

Mas. *Corpus* crassum. *Proboscis* robusta. *Palpi* verticem superantes; articulus 2us subarcuatus, subdilatatus; 3us linearis, gracilis, 2^{i} dimidio non longior. *Antennæ* validæ, glabræ. *Abdomen* alas posticas superans; fasciculus apicalis parvus, compressus. *Pedes* robusti, pilosi; tibiæ posticæ calcaribus quatuor longissimis. *Alæ* amplæ; anticæ apice rotundatæ.

Male. Body very robust. Proboscis stout, of moderate length. Palpi ascending higher than the vertex; 2nd joint slightly curved and dilated; 3rd linear, slender, about half the length of the 2nd. Antennæ stout, smooth. Abdomen extending somewhat beyond the hind wings;

apical tuft small, compressed. Legs stout, pilose; hind tibiæ with four very long spurs. Wings ample. Fore wings somewhat rounded at the tips; costa straight; exterior border very convex, moderately oblique.

377. Asta quadrilinea, n. s. *Mas.* Obscure rufo-fusca, palpis testaceis, alis anticis purpurascente tinctis, lineis quatuor nigro-fuscis rectis obliquis parallelis, guttis duabus discalibus nigro-fuscis, linea submarginali angulosa, alis posticis obscure fuscis.

Male. Dark reddish brown; underside paler and with a cinereous tinge. Palpi testaceous. Fore wings with a purplish bloom, and with four straight, oblique, parallel, nearly equidistant blackish-brown lines; two blackish-brown discal dots, one between the 1st and 2nd lines, the other between the 2nd and 3rd lines; submarginal line slight, zigzag. Hind wings dark brown, with two lines and an intermediate dot on the under side. Length of the body 8 lines; of the wings 20 lines.

Fam. CATEPHIIDÆ, *Guén.*

Gen. Anophia, *Guén.*

378. Anophia limitaris, n. s. *Mas.* Fusca, cinereo varia, alis anticis lineis tribus angulosis nigris, reniformi maculaque exteriore fuscis, alis posticis cupreo-fuscis basi albis.

Male. Brown, varied with cinereous. Palpi ascending; 3rd joint lanceolate, more than half the length of the 2nd. Antennæ simple. Legs very stout; femora and tibiæ fringed. Fore wings with three black zigzag lines; third line bent in front, connected by a short inward line with an elongated brown spot; the latter connected in front by another little line with the irregular brown reniform mark; marginal lunules blackish, slender; costa with whitish marks. Hind wings cupreous brown, white towards the base, and with a white mark along the fore part of the exterior border; interior border with a white fringe. Length of the body 8 lines; of the wings 18 lines.

379. Anophia angulifera, n. s. *Fœm.* Cinereo-fusca, antennis subserratis, abdomine flavescente vitta fusca, alis anticis basi fasciaque lata albidis, lineis duabus basalibus angulatis nigris, spatio marginali nebulis fuscis strigaque obliqua nigra, alis posticis basi et apud angulum interiorem flavescentibus.

Female. Cinereous brown. Palpi slightly ascending; 3rd joint linear, about one-third of the length of the 2nd. Antennæ very minutely serrated. Abdomen yellowish, with a broad brown stripe. Fore wings whitish at the base, and with a broad whitish band, the latter emitting a bidentate streak into the exterior part of the disk; two angular black lines near the base; marginal space obliquely shaded with brown, and containing an oblique black streak; marginal lunules black. Hind wings yellowish towards the base and on the interior

angle; fringe yellowish, with brown marks. Length of the body 5 lines; of the wings 14 lines.

380. Anophia suffundens, n. s. Obscure ferrugineo-fusca, abdomine cinereo, tibiis posticis fimbriatis, alis anticis lineis duabus nigris duplicatis, 1ª denticulata, 2ª undulata, linea exteriore nigra obliqua brevi, reniformi olivaceo-pallida, alis posticis fuscis basi albis.

Dark ferruginous brown. Palpi rising higher than the vertex; 3rd joint linear, much more than half the length of the 2nd. Abdomen and underside cinereous. Hind tibiæ fringed. Fore wings here and there blackish-tinged; interior and exterior lines black, double, the former slightly denticulated, the latter undulating; a more exterior oblique black line extending from the costa to the middle of the exterior border; reniform mark pale, with an olive tinge; marginal lunules black; costa with some whitish subapical points. Hind wings brown, white towards the base. Length of the body 5 lines; of the wings 14 lines.

Gen. Idicara, n. g.

Mas. Corpus crassum. *Palpi* verticem vix superantes; articulus 3ᵘˢ linearis, 2ⁱ dimidio non longior. *Antennæ* subpubescentes. *Abdomen* longissimum, lateribus apiceque dense pilosis. *Pedes* robusti; tibiæ densissime fasciculatæ. *Alæ* anticæ apice subrotundatæ; posticæ fasciculo densissimo recurvo apud marginem interiorem.

Male. Body very stout. Palpi hardly rising higher than the vertex; 3rd joint linear, rounded at the tip, about half the length of the 2nd. Antennæ minutely pubescent. Abdomen very long, extending far beyond the hind wings, thickly clothed on each side and at the tip. Legs stout; tibiæ most densely tufted. Wings moderately broad. Fore wings slightly rounded at the tips; costa straight; exterior border convex, its hind part rather oblique. Hind wings with a very dense recurved tuft on the interior border.

Allied to *Anophia*.

381. Idicara olivacea, n. s. *Mas.* Viridescenti-cinerea, thorace lineis duabus transversis nigris, abdomine pallide cervino, fasciculo apicali nigricante, alis anticis nigro subconspersis, lineis tribus angulosis nigris, litura submarginali brevi lata nigricante, alis posticis æneo-fuscis basi albis.

Male. Greenish cinereous, paler and tinged with fawn-colour beneath. Thorax with two black transverse lines. Abdomen pale fawn-colour; apical tuft blackish. Fore wings thinly black-speckled, with the basal, interior, and exterior lines black, zigzag, the third bent outward; reniform mark incompletely bordered with black; a short broad blackish mark near the exterior border towards the tip; marginal points black. Hind wings æneous brown, white towards the base; tuft on the interior border dark brown. Length of the body 10 lines; of the wings 20 lines.

Gen. Remusia, *Walk.*

382. Remusia intrahens, *Walk. Cat. Lep.* 3rd ser. 1780.—Anophia smaragdina, *Walk. Cat. Lep.* 3rd ser. 1811.

383. Remusia hirtissima, n. s. *Mas.* Cervina, pilosissima, abdominis lateribus densissime floccosis, fasciculo apicali longo, alis anticis cinereo variis, nigro subconspersis, lituris basalibus punctisque marginalibus nigris, lunula discali alba, plaga maxima fusca nigro marginata, margine interiore pilis longissimis fimbriato, alis posticis margine exteriore cinereo.

Male. Fawn-colour, very pilose. Palpi ascending a little higher than the vertex; 3rd joint about half the length of the 2nd. Antennæ very distinctly setulose and pubescent. Abdomen very densely floccose along each side; apical tuft long. Fore wings partly cinereous, thinly and irregularly black-speckled; a very large brown black-bordered patch, which is dilated hindward towards the base, and extends to the interior border, but not to the costa; some black marks of various size towards the base; a white discal lunule; marginal points black; interior border fringed with very long hairs. Hind wings cinereous along the exterior border. Length of the body 7 lines; of the wings 16 lines.

Gen. Steiria, *Walk.*

384. Steiria signifera, *Walk. Cat. Lep.* 3rd ser. 1136.

385. Steiria trajiciens, *Walk. Cat. Lep.* 3rd ser. 1137.

Inhabits also Ceylon.

386. Steiria ferrifera, n. s. *Fœm.* Ferruginea, thorace linea transversa interrupta nigra, alis anticis lineis fuscis undulatis indistinctis, linea media nigra vix undulata, reniformi nigro notata et marginata, spatio marginali pallido lineis diffusis nigricantibus, alis posticis cinereo-hyalinis fusco latissime marginatis.

Female. Ferruginous. Third joint of the palpi less than half the length of the 2nd. Thorax with an interrupted transverse black line. Abdomen and underside cinereous. Fore wings with some indistinct transverse undulating brown lines; middle line black, hardly undulating, very near the reniform mark, which is bordered and pupilled with black; exterior part mostly cinereous or whitish, with diffuse transverse blackish lines; marginal points black. Hind wings cinereous hyaline, iridescent, with very broad dark brown borders; fringe cinereous. Length of the body 9 lines; of the wings 20 lines.

387. Steiria repleta, n. s. *Fœm.* Ferruginea, thorace fascia antica nigra, alis anticis lituris plurimis nigris transversis interruptis angulatis, macula basali nigra, reniformi viridescente nigro marginata, alis posticis cinereo-hyalinis fusco late marginatis.

Female. Ferruginous. Thorax with a black band in front. Abdomen

and underside cinereous. Fore wings with numerous transverse more or less interrupted and angular black marks; a black discal spot near the base; reniform mark greenish, elongated, oblique, black-bordered. Hind wings cinereous hyaline, with a broad brown border. Length of the body 7 lines; of the wings 16 lines.

388. Steiria humeralis, n. s. *Fœm.* Cinerea, capite thoraceque antico cervinis, alis anticis ferrugineis, spatio exteriore cinereo fasciam nigricantem interruptam includente, reniformi nigro marginata, vitta costali basali albida, alis posticis cinereo-hyalinis fusco late marginatis.

Female. Cinereous. Head and fore part of the thorax fawn-colour. Third joint of the palpi almost as long as the 2nd. Fore wings ferruginous, except for about one-third of the surface from the exterior border; the cinereous part is traversed by an irregular and interrupted blackish band, and is much narrower towards the costa, where it contains an interrupted black longitudinal line; reniform mark black-bordered, partly included in the cinereous part; a whitish stripe along the basal part of the costa; marginal lunules black. Hind wings cinereous hyaline, with a broad brown border. Length of the body 7 lines; of the wings 16 lines.

389. Steiria albistriga, n. s. *Mas.* Ferrugineo-fusca, abdomine longo basi albido, alis anticis nigricante strigatis, linea exteriore nigra undulata, reniformi ex parte nigra strigaque discali alba contiguis, alis posticis albis subhyalinis fusco latissime marginatis.

Male. Ferruginous brown. Third joint of the palpi hardly half the length of the 2nd. Abdomen æneous brown, whitish towards the base, extending much beyond the hind wings. Fore wings with blackish streaks, and with a black undulating transverse exterior line; a white streak in the disk by the reniform mark, which is partly black; marginal lunules black. Hind wings white, slightly hyaline, with a very broad æneous-brown border. Length of the body $5\frac{1}{2}$ lines; of the wings 12 lines.

390. Steiria æquilinea, n. s. *Fœm.* Fusca, abdomine alas posticas perpaullo superante, alis anticis lineis nonnullis denticulatis obscure fuscis subobliquis pallido marginatis, orbiculari et reniformi indistinctis, alis posticis obscure fuscis.

Female. Brown. Palpi obliquely ascending; 3rd joint hardly half the length of the 2nd. Abdomen extending very little beyond the hind wings. Legs stout; spurs long. Fore wings with several denticulated, parallel, slightly oblique dark brown, mostly buff-bordered lines; marginal line dark brown, buff-bordered on the inner side, and with buff points; orbicular and reniform marks indistinct. Hind wings dark brown. Length of the body 5 lines; of the wings 14 lines.

Gen. Spersara, n. g.

Mas. Corpus robustum. *Proboscis* conspicua. *Palpi* ascendentes,

verticem non superantes; articulus 2us securiformis, latissimus; 3us securiformis, minimus. *Antennæ* longissimæ, dimidio basali subserrato subpubescente. *Abdomen* longissimum. *Pedes* breves, femoribus tibiisque fimbriatis, calcaribus quatuor longis. *Alæ* perangustæ, apice rotundatæ.

Male. Body robust. Frontal tuft prominent. Proboscis distinct. Palpi ascending, not rising so high as the vertex; 2nd joint securiform, very broad; 3rd securiform, very minute. Antennæ very long, very minutely serrated and pubescent for half the length from the base. Abdomen tapering, very long, extending for more than half its length beyond the hind wings. Legs short; femora and tibiæ fringed with long hairs; hind tibiæ with four long spurs. Wings very narrow. Fore wings rounded at the tips; costa straight; exterior border slightly convex, extremely oblique.

Allied to *Ægilia*.

391. Spersara glaucopoides, n. s. *Mas.* Fusca, abdomine subtus trilineato, alis linea submarginali albida testacea denticulata informi interrupta, alis anticis purpureo tinctis, lineis transversis subobsoletis, orbiculari et reniformi nigris.

Male. Brown, mostly cinereous beneath. Abdomen beneath with three paler lines. Wings with an irregular and interrupted denticulated whitish testaceous submarginal line, which is most complete in the hind wings; marginal points black. Fore wings tinged with purple; transverse lines almost obsolete; orbicular and reniform marks black, the former punctiform, the latter forming an oblong ringlet. Length of the body 10 lines; of the wings 20 lines.

Gen. Minica, *Walk.*

392. Minica semialba, n. s. *Fœm.* Albida, capite thoraceque antico ferrugineo-fuscis, alis anticis lineis olivaceis undulatis indistinctis interruptis, vittula apud angulum interiorem plaga basali plagaque subapicali ferrugineis nigro strigatis, plaga discali maxima purpureo-fusca, alis posticis subhyalinis fusco latissime marginatis. *Mas* alis anticis plaga discali subobsoleta.

Female. Whitish. Head and fore part of the thorax ferruginous brown. Third joint of the palpi much shorter than the 2nd. Fore wings with transverse undulating, indistinct and incomplete olive-green lines; a short stripe by the interior angle, a patch near the tip of the costa, and another patch at the base of the costa ferruginous, black-streaked; a very large purplish-brown discal patch including the discal mark, and bounded by two black lines, the outer line much broader than the inner line and somewhat macular; marginal lunules black. Hind wings irridescent, almost hyaline, very broadly bordered with brown; marginal lunules blackish; fringe whitish. *Male.* Fore wings wholly tinged with olive-green; basal patch very small; discal patch almost

obsolete; the line along its outer side more distinctly macular. Length of the body 8 lines; of the wings 20 lines.

393. Minica nigrilinea, n. s. *Fœm.* Cinerea, capite thoraceque antico cervinis, alis anticis dimidio basali cervino lineam nigram includente, dimidio exteriore lineis nonnullis denticulatis fuscis fasciaque interrupta cervina, alis posticis subhyalinis fusco latissime marginatis.

Female. Cinereous. Head, fore part of the thorax, and fore wings for nearly half the surface from the base, bright fawn-colour. Third joint of the palpi nearly as long as the 2nd. Fore wings with a black line on the fawn-coloured part, which is bounded by a brown line; exterior part with slight transverse denticulated brown lines, and with a much interrupted fawn-coloured band; marginal points black. Hind wings iridescent, almost hyaline, very broadly bordered with brown; fringe whitish. Length of the body 7 lines; of the wings 16 lines.

Gen. Maceda, *Walk.*

394. Maceda mansueta, *Walk. Cat. Lep.* 3rd ser. 1141. *Var.* Calduba obtenta, *Walk. Cat. Lep.* 3rd ser. 1815.

Inhabits also Ceylon.

395. Maceda discalis, n. s. *Mas.* Cervina, subtus alba, abdomine subcristato, alis anticis lineis tribus fuscis angulosis, 3ª guttulari, litura basali nigricante, plaga costali cervina nigricante marginata punctum nigrum includente, alis posticis fuscis macula magna discali albida semihyalina.

Male. Fawn-colour, white beneath. Third joint of the palpi conical, hardly one-fourth of the length of the 2nd. Antennæ minutely pubescent. Abdomen brownish cinereous, slightly crested. Legs white beneath; tarsi with white bands. Fore wings with three more or less zigzag brown lines; 3rd line bent, somewhat guttular; blackish mark on the base of the interior border; a large dark fawn-coloured patch adjoining the costa, containing a black point, diffusedly blackish-bordered, dentate along the hind part of its outer side. Hind wings brown, with a large whitish semihyaline discal spot, and with an elongated white mark on the hind part of the exterior border. Length of the body 7 lines; of the wings 16 lines.

Fam. OPHIDERIDÆ, *Guén.*

Gen. Ophideres, *Boisd.*

396. Ophideres fullonica, *Linn. Syst.* i. 2. 812. 16 (Phalæna Noctua).

Inhabits also West Africa, Hindostan, Ceylon, Australia, Navigators' Islands, and New Hebrides?

Gen. Phyllodes, *Boisd.*

397. Phyllodes semilinea, n. s. *Fœm.* Cervina, alis anticis lineis subobscurioribus flexis diffusis indistinctis, linea longitudinali exteriore

fusca, orbiculari nigra punctiformi, reniformi maxima fusco et purpureo marginata, plagis duabus subtus obscure fuscis, alis posticis nigricantibus luteo fasciatis cervino marginatis.

Female. Fawn-colour. Third joint of the palpi capitate. Knees silvery. Abdomen extending a little beyond the hind wings. Fore wings with some indistinct, diffuse, more or less bent, slightly darker lines, and with a straight longitudinal brown line, which extends from near the hind end of the reniform mark to the tips; orbicular mark forming a black point; reniform mark very large, elongate, concave on the outer side, bordered with brown and with purple; underside with two dark brown patches. Hind wings blackish, broadly bordered with fawn-colour, and containing a dentate luteous band, which on the under side is limited to a luteous black-bordered patch. Length of the body 16 lines; of the wings 46 lines.

Gen. Potamophora, *Guén.*

398. Potamophora Manlia, *Cram. Pap. Exot.* i. 144, pl. 92. f. A (Phalæna Noctua).

Inhabits also Hindostan, Ceylon, China, Java, and the Philippine Islands. The wing-markings of this species are very variable.

399. Potamophora ferrifracta, n. s. *Fœm.* Fusca, alis lineis tribus nigris angulatis deviis pallido marginatis, spatio medio pallido atomis nigris, macula magna pallida, fascia subtus lata informi margaritacea, alis anticis striga lata rufo-ferruginea nigro marginata, alis posticis litura apud angulum interiorem ferruginea nigro interlineata.

Female. Brown, with many hoary hairs. Wings with three very irregular and angular black lines, which are bordered with cinereous buff; space between the 2nd and 3rd lines of the same pale hue, thickly speckled with black, except in front; a large pale spot resting on a streak, which connects the 2nd line with the 1st; under side with a broad very irregular pearly white band. Fore wings with a broad, reddish-ferruginous, partly black-bordered zigzag streak, which extends from the tips to the 3rd transverse line. Hind wings with a ferruginous black-interlined mark by the interior angle. Length of the body 14 lines; of the wings 36 lines.

Fam. OMMATOPHORIDÆ, *Guén.*

Gen. Ommatophora, *Guén.*

400. Ommatophora luminosa, *Cram. Pap. Exot.* iii. 147, pl. 274. f. D (Phalæna.)

Inhabits also Java and the Philippine Islands.

Gen. Nyctipao, *Hübn.*

401. Nyctipao crepuscularis, *Linn. Syst. Nat.* i. 2. 2811. 13 (Phalæna Attacus).

Inhabits also Hindostan and Java.

Gen. Hypopyra, *Guén.*

402. Hypopyra vespertilio, *Fabr. Ent.* iii. 2. 15. 23. (Noctua).
Inhabits also Hindostan, Ceylon, and China.

403. Hypopyra apicalis, n. s. *Fœm.* Pallide cinereo-cervina, alis nigro subconspersis, lineis tribus indistinctis undulatis cervinis, linea guttulari fusca, linea submarginali cinerea angulosa, alis anticis apice fuscescentibus.

Female. Pale cinereous fawn-colour. Third joint of the palpi rather shorter than the 2nd. Wings broad, thinly and minutely black-speckled, with three indistinct undulating fawn-coloured lines, and with one line formed of brown dots; submarginal line cinereous zigzag; submarginal points black; under side with one straight line of brown dots. Fore wings brownish at the tips. Length of the body 9 lines; of the wings 24 lines.

Fam. BENDIDÆ, *Guén.*

Gen. Hulodes, *Guén.*

404. Hulodes saturnioides, *Guén. Noct.* iii. 209. 1610.
Inhabits also Hindostan.

Gen. Culicula, n. g.

Mas. Corpus robustum. *Proboscis* conspicua. *Palpi* compressi, recurvi, verticem superantes; articulus 3us lanceolatus, subfimbriatus, 2^i^ dimidio non longior. *Antennæ* setulosæ, pubescentes. *Thoraæ* crassus. *Abdomen* attenuatum, alas posticas superans; fasciculus apicalis compressus. *Pedes* validi, subpilosi. *Alæ* anticæ latæ, apice rotundatæ, costa recta basi subdilatata, margine exteriore recto perobliquo.

Male. Body stout. Proboscis moderately long. Palpi much compressed, recurved over the back of the head; 3rd joint lanceolate, slightly fringed, about half the length of the 2nd. Antennæ setulose, pubescent. Thorax very robust. Abdomen attenuated, extending somewhat beyond the hind wings; apical tuft compressed. Legs stout, slightly pilose; hind tibiæ with four long spurs. Wings broad. Fore wings rounded at the tips; costa straight, slightly dilated at the base; exterior border straight, very oblique.

This genus is allied by its structure to some of the *Herminidæ.*

405. Culicula bimarginata, n. s. *Mas.* Pallide cervina, alis spatio marginali pallidiore, fascia submarginali recta obscure fusca extus concisa intus diffusa, lineis interiore et exteriore undulatis valde indistinctis, lunula subtus discali fusca, alis anticis puncto discali fusco.

Male. Pale fawn-colour, with a cinereous tinge on the underside. Wings with a straight dark-brown submarginal band, which is diffuse on the interior side and concise on the outer side, where the marginal space is paler than the wings elsewhere; interior and exterior lines undulating, very indistinct, a little darker than the ground-hue; un-

derside with a brown discal lunule. Fore wings with a brown discal point. Length of the body 10 lines; of the wings 20 lines.

Fam. OPHIUSIDÆ, *Guén.*

Gen. Lagoptera, *Guén.*

406. Lagoptera pallescens, n. s. *Mas.* Pallide testaceo-cinerea, capite palpisque obscure fuscis, alis anticis nigro conspersis, lineis interiore et exteriore fusceseentibus, 1ª undulata, 2ª denticulata antice flexa, linea media minus determinata et reniformi nigro conspersa cervinis, spatio marginali obscuriore lineam submarginalem cineream undulatam includente, alis posticis pallide flaveseentibus margine latissimo nigro.

Male. Pale testaceous cinereous. Head and palpi dark brown. Abdomen and underside pale yellowish. Fore wings black-speckled, with the interior and exterior lines brownish, the 1st undulating, the 2nd denticulated, bent in front; middle line fawn-colour, less distinct; space beyond the exterior line darker than the ground-hue, including the undulating cinereous submarginal line; reniform mark fawn-colour, thickly speckled with black. Hind wings pale yellowish, with a very broad black border, which becomes narrower towards the interior angle. Length of the body 16 lines; of the wings 40 lines.

Gen. Cerbia, *Walk.*

407. Cerbia subolivacea, n. s. *Mas.* Pallide olivaceo-cervina, subtus lutescenti-cervina, abdomine cristato, alis anticis latis nigro conspersis, lineis nonnullis denticulatis nigris ex parte nigro nebulosis, alis posticis linea exteriore fasciaque submarginali nigricantibus.

Male. Pale fawn-colour, tinged with olive-green, lutescent fawn-colour beneath. Third joint of the palpi a little shorter than the 2nd, and less than half its breadth. Antennæ stout, thickly setulose and pubescent. Thorax very robust. Abdomen crested, not extending beyond the hind wings. Legs stout; spurs long. Wings broad, with black marginal points. Fore wings with black speckles, and with several denticulated black lines, some of which are partly and slightly shaded with black; underside, and both surfaces of the hind wings, with a blackish exterior line and a blackish submarginal band, which is broadest in the hind wings. Length of the body 9 lines; of the wings 20 lines.

Gen. Ophisma, *Guén.*

408. Ophisma inversa, *Walk. Cat. Lep.* 3rd ser. 1384.

409. Ophisma rubida, n. s. *Mas.* Saturate rufa, subtus cervina, alis anticis costa pallidiore subcinerea, lineis duabus postice obsoletis, fascia marginali glauco-cana extus diffusa intus concisa, punctis duobus

discalibus, 1° nigricante, 2° majore albido, alis posticis fuscis fascia media alba.

Male. Deep dark red, fawn-colour beneath. Third joint of the palpi extremely small. Antennæ minutely setulose and pubescent. Abdomen brown, not extending beyond the hind wings. Fore wings paler, and with a cinerous tinge along the costa; two transverse lines, apparent only in the fore part of the wing; a marginal glaucous hoary band, concise on the inner side, diffuse on the outer side, where it is intersected by lunules; two discal points, one blackish, the other larger, whitish, bordered with dark red. Hind wings brown, with a white middle band; exterior border slightly marked with white; fringe cinereous. Length of the body 14 lines; of the wings 32 lines.

410. Ophisma velata, n. s. *Fœm.* Cinereo-fusca, subtus ochracea, alis anticis ferrugineis, lineis quatuor nigricantibus, 1ª basali, 2ª recta extus diffusa, 3ª undulata, 4ª serpentina, linea exteriore e punctis elongatis nigris albido notatis, alis posticis subochraceis fusco bifasciatis.

Female. Cinereous brown, ochraceous beneath. Third joint of the palpi lanceolate, about one-third of the length of the 2nd. Wings broad; marginal line blackish, undulating. Fore wings ferruginous, with four blackish lines; 1st line very near the base; 2nd straight, diffuse on the outer side; 3rd undulating; 4th most deeply meandering, with a whitish mark in front, and having beyond it a line of elongated black whitish-marked points. Hind wings dull ochraceous, with two diffuse brown bands, the latter very broad. Length of the body 8 lines; of the wings 20 lines.

411. Ophisma lutea, n. s. *Mas.* Lutea, capite antico fusco, alis nigro subconspersis linea obliqua recta ferruginea intus nigricante et diffusa, alis anticis litura subcostali nigra lineisque tribus ochraceis transversis costalibus.

Male. Luteous. Head in front and palpi brown. Antennæ minutely setulose and pubescent. Abdomen paler than the thorax, extending a little beyond the hind wings. Legs rather slender; tarsi long, spinose. Wings thinly black-speckled, paler towards the inner side of a straight ferruginous line, which extends from the tips of the fore wings to the interior angle of the hind wings; this line is blackish and diffuse on the inner side. Fore wings with a black subcostal mark which consists of a point and of an irregular lunule, and three incipient ochraceous lines which only appear by the costa. Length of the body 12 lines; of the wings 28 lines.

Gen. Achæa, *Hübn.*

412. Achæa atrivitta, n. s. *Fœm.* Fusca, subtus testaceo-cinerea, alis anticis chalybeo-ferrugineis, linea atra recta obliqua, lineis tribus nigris deviis, lituris nonnullis testaceis, alis posticis macula discali alba, fimbria albo binotata.

Female. Brown, testaceous-cinereous beneath. Third joint of the palpi pale with a blackish band, much shorter than the 2nd, and less than half its breadth. Fore wings ferruginous with a chalybeous bloom, and with a straight somewhat irregular deep black line which extends from the base to a little in front of the interior angle, some irregular testaceous marks here and there, and three irregular black lines; marginal festoon black; under side with a hindward dark brown stripe and two dark brown bands. Hind wings with a white discal spot; fringe with two white marks; under side with a brown discal lunule, with a zigzag brown line, and with two exterior partly connected bands. Length of the body 9 lines; of the wings 22 lines.

413. Achæa semipallida, n. s. *Mas.* Fusca, alis anticis costa margineque exteriore albido-cervinis, margine interiore fuscescente, vitta obliqua informi nigra, striga apicali lata fusca nigro marginata, lineis duabus indistinctis transversis, orbiculari et reniformi atris, alis posticis albo trimaculatis, fimbria albo binotata.

Male. Brown; under side pale cinereous with a testaceous tinge. Abdomen paler than the thorax, and with a cinereous tinge. Wings beneath with markings much like those of *A. atrivitta*. Fore wings whitish, fawn-colour along the costa and about the exterior border, brownish along the interior border, with a black irregular stripe which extends from the base to a little in front of the interior angle, and with a broad brown irregularly black-bordered streak along the apical part of the costa; two irregular indistinct transverse lines; orbicular and reniform marks deep black, the former punctiform, the latter of the usual shape. Hind wings with three white spots, and with two white marks on the fringe. Length of the body 9 lines; of the wings 22 lines.

Nearly allied to *A. signivitta*.

414. Achæa purpureilinea, n. s. *Fœm.* Cervina, alis anticis strigis transversis lineisque tribus fuscis, linea 3ª duplicata valde arcuata, linea submarginali undulata ex parte purpurea, reniformi pallida albo marginata, annulo posteriore oblongo fusco, alis posticis albido trimaculatis, fimbria albido binotata.

Female. Fawn-colour. Abdomen cinereous brown. Wings beneath much like those of the two preceding species. Fore wings with numerous transverse brown streaks which are partly confluent; two interior brown lines and one exterior line which is double and much curved; submarginal line undulating, purple in front and hindward; submarginal points black; interior border cinereous, tinged with purple; orbicular mark punctiform; reniform pale, white-bordered, trans-

versely elliptical, having behind it a longitudinally oblong brown ringlet. Hind wings brown, with three whitish spots, and with two whitish marks on the fringe. Length of the body 10 lines; of the wings 22 lines.

Nearly allied to *A. cyllota*.

415. Achæa pulchrivena, n. s. *Fœm.* Fusca, abdominis segmentis albido marginatis, alis anticis ferrugineis, lituris nebulisque nigris, linea 1ª basali, 2ª 3ªque duplicatis, linea submarginali alba denticulata, fimbria albido uninotata, reniformi ex parte albido marginata, venis chalybeis, alis posticis albido binotatis, fimbria albo uninotata.

Female. Brown, pale beneath. Abdominal segments with whitish fore borders. Wings beneath much like those of *A. atrivitta*, but with the brown hue more prevalent. Fore wings ferruginous, partly shaded with black, with black markings; 1st line basal; interior and exterior lines double, the latter much curved outward; submarginal line white, denticulated; fringe with a whitish mark in the middle; orbicular mark punctiform; reniform partly whitish-bordered; veins mostly chalybeous. Hind wings with two whitish discal marks, and with a white mark on the fringe. Length of the body 8 lines; of the wings 18 lines.

Gen. Ophiusa, *Ochs.*

416. Ophiusa fulvotænia, *Guén. Noct.* iii. 272, 1710.

Inhabits also Hindostan, Ceylon, Sumatra, and Java.

417. Ophiusa Joviana, *Cram. Pap. Exot.* iv. 237, pl. 399. f. B (Phalæna Noctua).

Inhabits also Hindostan, where it attains a larger size.

Gen. Grammodes, *Guén.*

418. Grammodes Mygdon, *Cram. Pap. Exot.* ii. 94, pl. 156. f. G (Phalæna Noctua).

Inhabits also Hindostan, Ceylon, and Java.

Gen. Crithote, n. g.

Mas. Corpus sat gracile. *Proboscis* conspicua. *Palpi* oblique ascendentes, verticem non superantes; articulus 3ᵘˢ minimus. *Antennæ* subpectinatæ. *Abdomen* longum, alas posticas paullo superans. *Pedes* longi, graciles, pilis longissimis dense vestiti. *Alæ* anticæ acutæ, costa recta, margine exteriore recto sat obliquo; posticæ costa basi dilatata apice obliqua, margine interiore pilis longissimis fimbriato.

Male. Body rather slender. Frontal tuft prominent. Proboscis moderately long, Palpi obliquely ascending, not rising higher than the vertex; 3rd joint obtuse, not more than one-eighth of the length of the 2nd. Antennæ slightly pectinated. Abdomen long, extending a little beyond the hind wings. Legs long, slender; posterior femora

and tibiæ densely clothed with extremely long hairs; spurs long. Wings moderately broad. Fore wings acute; costa straight; exterior border straight, rather oblique, Hind wings with the costa dilated at the base, oblique towards the tip; interior border fringed with very long hairs.

This genus has a very peculiar structure, and does not associate well with any of the described families of the *Noctuites*.

419. CRITHOTE HORRIDIPES, n. s. *Mas.* Obscure fusca, capite thoraceque antico nigricantibus, abdomine cinereo, alis anticis basi fuscescenti-cinereis.

Male. Dark brown. Vertex and fore part of the thorax blackish. Abdomen cinereous. Legs with blackish hairs. Fore wings obliquely brownish cinereous at the base. Hind wings a little paler than the fore wings. Length of the body $7\frac{1}{2}$ lines; of the wings 16 lines.

Fam. REMIGIIDÆ, *Guén.*

Gen. REMIGIA, *Guén.*

420. Remigia frugalis, *Fabr. Ent. Syst.* iii. 2. 138 (Noctua).

Inhabits also West Africa, Hindostan, Ceylon, and Java.

421. Remigia Archesia, *Cram. Pap. Exot.* iii. 145, pl. 273. f. F, G (Phalæna Noctua).

Inhabits also Sierra Leone, Hindostan, China, Ceylon, and Java.

422. REMIGIA INTRACTA, n. s. *Mas.* Cinereo-cervina, abdomine apicem versus compresso, tibiis dense pilosis, alis lineis undulatis subobscurioribus fere obsoletis, fascia cinerea lata indistincta subundulata.

Male. Cinereous fawn-colour, the former hue more prevalent beneath. Palpi ascending much higher than the vertex; 3rd joint linear, much shorter than the 2nd. Antennæ minutely setulose. Abdomen towards the tip and apical tuft compressed. Tibiæ densely pilose; hairs of the fore tibiæ much shorter than those of the posterior tibiæ. Wings with undulating almost obsolete lines, which are very little darker than the ground-hue; a broad, cinereous, indistinct, slightly undulating band; marginal points black. Length of the body 7 lines; of the wings 16 lines.

423. REMIGIA ZETA, n. s. *Mas.* Cervina, subtus pallide cinerea, femoribus tibiisque subfimbriatis, alis lineis duabus nigricantibus diffusis indistinctis albido punctatis, alis anticis striga discali nigra transversa undulata.

Male. Fawn-colour, pale cinereous beneath. Vertex reddish. Palpi dark cinereous, ascending higher than the vertex; 3rd joint linear, obtuse at the tip, much shorter than the 2nd. Antennæ setulose and pubescent. Femora and tibiæ slightly fringed. Wings ample; interior and exterior lines blackish, diffuse, indistinct, accompanied by

whitish points almost obsolete in the hind wings; marginal points black. Fore wings with an undulating transverse black discal streak; three white costal subapical points. Length of the body 8 lines; of the wings 17 lines.

424. Remigia? bendioides, n. s. *Mas.* Pallide cinerea, abdomine lineari fasciis fuscescentibus subtus floccoso, pedibus validis, alis lineis quinque fuscis obliquis subrectis, macula discali fasciisque duabus subtus nigricantibus, alis anticis litura apicali strigaque postica interrupta nigricantibus, costa lineisque duabus interioribus testaceis.

Male. Pale cinereous, darker beneath. Head testaceous. Palpi hardly curved, rising a little higher than the vertex; 3rd joint lanceolate, pilose, about half the length of the 2nd. Antennæ setulose, pubescent. Abdomen linear, with brownish bands; under side floccose. Legs stout, pilose. Wings ample, with five oblique almost straight brown lines; marginal points black; under side with a blackish discal spot and two blackish bands. Fore wings very acute, with a blackish apical mark, and with a short blackish interrupted streak near the interior angle; costa and two interior lines testaceous; two black points in a line on the disk. Length of the body 7 lines; of the wings 16 lines.

Fam. AMPHIGONIDÆ, *Guén.*

Gen. Amphigonia, *Guén.*

425. Amphigonia costistriga. Obscure rufescenti-fusca, pectore albo, tibiis pilis longissimis dense fimbriatis, alis lineis subobscurioribus angulatis valde indistinctis, alis anticis linea recta obliqua obscure fusca, costa luteo-strigata, reniformi ochracea albo tripunctata.

Dark reddish brown, cinereous brown beneath. Pectus white. Tibiæ thickly fringed with very long hairs. Wings ample; exterior border distinctly angular in the middle; lines angular, very indistinct, a little darker than the ground-hue. Fore wings acute, with a straight dark brown line which extends from near the tip of the costa to the interior angle; costa with luteous streaks; reniform mark ochraceous, with three white points. Length of the body 7? lines; of the wings 20 lines.

Fam. THERMESIDÆ, *Guén.*

Gen. Sympis, *Guén.*

426. Sympis rufibasis, *Guén. Noct.* iii. 344, 1809.

Inhabits also Hindostan, Sumatra, and Java.

Gen. Thermesia, *Hübn.*

427. Thermesia finipalpis, *Walk. Cat. Lep.* 3rd ser. 1574.

Inhabits also Ceylon.

428. Thermesia antecedens, n. s. Læte ochracea, alis luteo variis

nigro subconspersis, linea media nigra recta, lineis aliis nigricantibus angulosis indistinctis, alis anticis fuscescenti-cinereo nebulosis, orbiculari e puncto nigro.

Bright ochraceous, dull pale luteous beneath. Third joint of the palpi lanceolate, hardly one-third of the length of the 2nd. Wings mottled with luteous, and slightly speckled with black; middle line black, straight, oblique; the other lines blackish, zigzag, indistinct; exterior line with black points; submarginal points black. Fore wings partly shaded with brownish cinereous; orbicular mark represented by a black point. Length of the body 6 lines; of the wings 16 lines.

Closely allied to *T. subrutilans*.

429. Thermesia metagona, n. s. *Mas.* Ferruginea, pedibus nigro punctatis, alis obscure ochraceis, lineis interiore et exteriore ferrugineis subrectis apud costam retractis, linea submarginali nigra denticulata, alis anticis margine exteriore vix flexo, alis posticis striga lata postica schistacea nigro marginata.

Male. Ferruginous, much paler beneath. Palpi slightly curved, ascending much higher than the vertex; 3rd joint lanceolate, a little shorter than the 2nd. Antennæ setulose. Legs with a few black points. Wings dull dark ochraceous, mostly luteous beneath; interior and exterior lines ferruginous, oblique, nearly straight, retracted towards the costa of the fore wings; submarginal line black, denticulated, distinguished by points in the hind wings, accompanied by white points towards the costa of the fore wings. Fore wings rectangular at the tips; exterior border hardly bent. Hind wings with the exterior line terminating in a broad, slaty, blackish-bordered streak. Length of the body 7 lines; of the wings 16 lines.

430. Thermesia discontenta, n. s. *Mas.* Ferrugineo-rufa, abdomine alas posticas superante, alis latis cinereo suffusis, lineis ferrugineis undulatis indistinctis, alis anticis subfalcatis, margine exteriore medio subconvexo.

Male. Ferruginous red, with a cinereous tinge beneath. Third joint of the palpi much shorter than the 2nd. Antennæ minutely setulose. Abdomen extending beyond the hind wings. Wings broad, with a cinereous tinge; lines ferruginous, undulating, indistinct. Fore wings subfalcate; exterior border slightly convex in the middle. Length of the body 9 lines; of the wings 18 lines.

431. Thermesia noctinix, n. s. Obscure fusca, tibiis fimbriatis, alis linea exteriore cinerea subdenticulata, linea submarginali subobsoleta, alis anticis apice rectangulatis, linea interiore cinerea denticulata indistincta, orbiculari et reniformi niveis, litura costali alba.

Dark brown, a little paler beneath. Palpi curved, ascending much higher than the vertex; 2nd joint pilose; 3rd lanceolate, very slender, as long as the 2nd. Tibiæ fringed. Wings moderately broad, with a cinereous exterior slightly denticulated line, which is bent towards

the costa of the fore wings, where it terminates in a white mark; submarginal line nearly obsolete. Fore wings rectangular at the tips, with an interior indistinct denticulated cinereous line; orbicular and reniform marks pure white, the former small, the latter large. Length of the body 7 lines; of the wings 18 lines.

432. THERMESIA POAPHILOIDES, n. s. *Mas.* Cervina, pedibus non pilosis, alis lineis media et exteriore fuscescentibus denticulatis valde indistinctis, linea submarginali pallide cinerea interrupta, alis anticis linea interiore indistincta, orbiculari pallida punctiformi, reniformi e punctis duobus nigris, plaga costali magna nigro-fusca.

Male. Dull fawn-colour, with a cinereous tinge beneath. Palpi slightly curved, ascending above the vertex; 2nd joint pilose; 3rd lanceolate, much shorter than the 2nd. Antennæ minutely setulose. Legs smooth. Wings moderately broad, with the middle and exterior lines brownish, denticulated, very indistinct; submarginal line interrupted, pale cinereous, accompanied by longitudinal black streaks, entire towards the costa of the fore wings, where it borders the large costal subapical blackish-brown patch; marginal points black. Fore wings acute, with an interior very indistinct line; orbicular mark pale, punctiform; reniform distinguished by two transversely placed black points. Length of the body 7 lines; of the wings 18 lines.

433. THERMESIA? CRASSIUSCULA, n. s. *Fœm.* Pallide ochracea, tibiis subdilatatis subfimbriatis, alis linea recta obliqua ochracea apud costam retracta, linea exteriore indistincta, linea submarginali subobsoleta, alis anticis linea interiore tenui angulosa, margine exteriore vix flexo.

Female. Pale ochraceous, stout. Thorax squamous. Abdomen not extending beyond the hind wings. Legs stout; tibiæ slightly dilated and fringed; spurs long. Wings with a straight oblique ochraceous line which is abruptly retracted towards the costa of the fore wings, and is accompanied on the outer side by an indistinct line which is most apparent in the hind wings; submarginal line almost obsolete. Fore wings rectangular at the tips; interior line slender, zigzag; exterior border hardly bent. Length of the body 4 lines; of the wings 18 lines.

434. THERMESIA RUFICEPS, n. s. *Mas.* Cinereo-cervina, subtus rufescens, capite thoraceque antico saturate rufis, alis linea pallida recta obliqua apud costam recurva, linea interiore denticulata minus determinata, puncto discali punctisque submarginalibus nigris, alis anticis acutis subfalcatis, margine exteriore subangulato, punctis tribus discalibus fuscis.

Male. Fawn-colour with a cinereous tinge, reddish beneath. Head and fore part of the thorax deep red. Antennæ minutely setulose. Abdomen not extending beyond the hind wings, with a radiating apical tuft. Wings with a pale, straight, oblique, dark-bordered line which

is recurved towards the costa of the fore wings; interior line like the exterior line, but denticulated and less distinct; discal point and submarginal points black. Fore wings acute, subfalcate; exterior border slightly angular in the middle; discal point accompanied by three brown points. Length of the body $3\frac{1}{2}$ lines; of the wings 9 lines.

435. Thermesia nigripalpis, n. s. *Fœm.* Rufescenti-cervina, capite nigricante, palpis porrectis fimbriatis, femoribus tibiisque fimbriatis, alis latiusculis, lineis tribus nigricantibus denticulatis albo punctatis, linea submarginali valde interrupta, alis anticis vix acutis.

Female. Reddish fawn-colour. Head and palpi blackish. Palpi porrect, fringed, extending beyond the head; 3rd joint elongate-conical, less than half the length of the 2nd. Abdomen not extending beyond the hind wings. Legs rather slender; femora and tibiæ fringed; hind tibiæ with four very long spurs. Wings rather broad; interior, exterior, and submarginal lines blackish, denticulated, white-pointed, especially diffuse and incomplete in the hind wings; submarginal line very incomplete; marginal points black. Fore wings hardly acute; costa straight; exterior border slightly convex. Length of the body 4 lines; of the wings 10 lines.

436. Thermesia plagifera, n. s. *Fœm.* Pallide cervina, palpis longis fimbriatis, femoribus tibiisque fimbriatis, alis latis breviusculis, atomis lineisque tribus diffusis denticulatis punctisque submarginalibus roseis, fimbria e punctis roseis bilineata, alis anticis costa nigro punctata, plaga marginali nigricante, alis posticis plaga subtus apicali nigricante.

Female. Pale fawn-colour. Palpi long, fringed, extending far beyond the head; 3rd joint lanceolate, about one-third of the length of the 2nd. Abdomen not extending beyond the hind wings. Legs moderately stout; femora and tibiæ fringed; hind tibiæ with four very long spurs. Wings broad, rather short, rosy-speckled and with three diffuse denticulated lines of the same hue; submarginal points rosy, fringe long, with two rows of rosy-marked points. Fore wings rectangular at the tips, with two blackish white-marked discal points; costa very slightly convex, with black points; exterior border convex; under side with a very large blackish patch along the exterior border hindward. Hind wings with a large blackish apical patch. Length of the body $4\frac{1}{2}$ lines; of the wings 11 lines.

437. Thermesia sparsa, n. s. *Fœm.* Pallide rosea, capite thoraceque antico obscure ochraceis, alis breviusculis latiusculis nigro subconspersis, linea exteriore fusca obliqua subrecta apud costam retracta, spatio marginali cervino, linea submarginali e lituris elongatis nigricantibus albido punctatis, alis anticis subfalcatis, linea interiore angulosa, margine exteriore angulato.

Female. Pale rosy red. Head and fore part of the thorax dark ochraceous. Palpi not ascending higher than the vertex; 3rd joint very

short. Abdomen not extending beyond the hind wings. Legs smooth. Wings rather short and broad, thinly black-speckled; exterior line brown, oblique, nearly straight, retracted towards the costa of the fore wings; space along the exterior border fawn-colour, which hue is blended with the ground-colour; submarginal line indicated by elongated blackish marks with whitish points; submarginal points black. Fore wings subfalcate; interior line zigzag, a little darker than the ground-hue; a blackish costal spot, accompanied by two black dots; costa straight; exterior border angular in the middle. Length of the body 3 lines; of the wings 8 lines.

Gen. Capnodes, *Guén.*

438. Capnodes maculicosta, *Walk. Cat. Lep.* 3rd ser. 1608.
Inhabits also Ceylon.

439. Capnodes intractata, n. s. *Fœm.* Rufescenti-cervina, albido suffusa, capite thoraceque antico ochraceis, pectore, ventre pedibusque posterioribus albis, alis latiusculis, lineis interiore et exteriore fuscescentibus undulatis indistinctis, linea submarginali vix conspicua, alis anticis subfalcatis, costa albo punctata.

Female. Reddish fawn-colour, mostly suffused with a whitish hue. Head and fore part of the thorax ochraceous. Palpi not ascending higher than the vertex; 3rd joint linear, rather obtuse at the tip, about one-third of the length of the 2nd. Abdomen not extending beyond the hind wings. Pectus, under side of the abdomen, and posterior legs white. Spurs long. Wings moderately broad; interior and exterior lines brownish, undulating, indistinct; submarginal line very indeterminate; marginal points brown. Fore wings acutely subfalcate; costa straight, with elongated white points; exterior border convex. Length of the body 3 lines; of the wings $8\frac{1}{2}$ lines.

440. Capnodes? anomioides, n. s. *Mas.* Ferrugineo-rufa, palpis verticem longe superantibus, antennis subpectinatis, tibiis et tarsorum articulis apice albis, alis anticis lineis duabus nigricantibus dentatis indistinctis, linea submarginali e punctis nigris, punctis duobus discalibus albis, alis posticis æneo-fuscis fimbria rufescente.

Male. Ferruginous red, mostly cinereous beneath. Palpi compressed, smooth, erect, rising much higher than the vertex; 3rd joint linear, rather shorter and more slender than the 2nd. Antennæ slightly pectinated. Abdomen extending a little beyond the hind wings. Legs stout, smooth; spurs long; tips of the tibiæ and of the joints of the tarsi white. Fore wings somewhat paler and brighter towards the interior angle; interior and exterior lines blackish, dentate, indistinct; submarginal line composed of black points, of which two or three towards the costa are marked with white; two white discal points. Hind wings æneous brown, with a reddish fringe. Length of the body 8 lines; of the wings 18 lines.

Gen. Selenis, *Guén.*

441. Selenis æqualis, n. s. *Fœm.* Cervina, capite thoraceque antico pallide cervinis, thorace postico et abdominis basi albis, alis linea exteriore subobscuriore obliqua subrecta extus cinereo marginata apud costam retracta, linea submarginali cinerea undulata indistincta, alis anticis acutis, vitta subcostali lata alba roseo conspersa.

Female. Fawn-colour, with a cinereous tinge beneath. Head and fore part of the thorax pale fawn-colour. Palpi not ascending higher than the vertex; 3rd joint conical, about one-fourth of the length of the 2nd. Thorax, except in front, and base of the abdomen white. Wings moderately broad; exterior line oblique, nearly straight, a little darker than the ground-hue, bordered with cinereous on the outer side, retracted towards the costa of the fore wings; submarginal line cinereous, undulating, indistinct; marginal points black. Fore wings acute, with a broad, white, rosy-speckled subcostal stripe, which forms a continuous line with the white part of the thorax, and contains a brown subapical dot. Length of the body 4 lines; of the wings 12 lines.

442. Selenis vacillans, n. s. *Fœm.* Cervina, thorace postico abdominisque basi albis, alis linea exteriore alba obliqua subrecta apud costam retracta, linea submarginali cinerea undulata valde indistincta, alis anticis acutis, vitta subcostali lata alba cervino conspersa maculam subapicalem fuscam includente.

Female. Fawn-colour. Thorax, except in front, and base of the abdomen white. Wings moderately broad; exterior line white, oblique, nearly straight, acutely retracted towards the costa of the fore wings; submarginal line cinereous, undulating, very indistinct; marginal points black. Fore wings acute, with a broad, white, fawn-speckled subcostal stripe, which contains a brown subapical spot, and is excavated hindward at the end. Length of the body 4 lines; of the wings 12 lines.

This species closely resembles *S. æqualis*, and forms the transition between it and *S. inæqualis*; it may be distinguished by the subcostal stripe, which is less regular in its outline, by the exterior line, which is obsolete in the hind wings, and by a blackish spot near the interior angle of the hind wings.

443. Selenis inæqualis, n. s. *Fœm.* Ochraceo-cervina, thorace postico abdominisque basi albidis, alis linea exteriore subobscuriore subundulata costam versus albo marginata, linea submarginali e punctis nigricantibus, alis anticis vitta subcostali lata albida purpurascenti-rufo conspersa, maculas duas fuscas subapicales includente.

Female. Ochraceous fawn-colour. Palpi stouter than those of the two preceding species, rising a little higher than the vertex. Thorax, except in front, and base of the abdomen whitish. Wings moderately

broad; exterior line slightly undulating, a little darker than the ground-hue, bordered with white towards the costa of the fore wings; submarginal line indicated by blackish points; marginal points blackish, white-bordered towards the costa of the fore wings. Fore wings acute, with a broad whitish subcostal stripe, which is thickly speckled with dark purplish red, and contains two brown subapical spots, and is most irregular towards its tip, where it is accompanied by a white streak, whose exterior half is testaceous. Length of the body 4 lines; of the wings 12 lines.

Gen. Talariga, *Walk.*

444. Talariga capacior, *Walk. Cat. Lep.* 3rd ser. 1634.
Inhabits also Sumatra.

Gen. Ginæa, *Walk.*

445. Ginæa pectoralis, n. s. *Fœm.* Cervina, pectore niveo, pedibus niveo variis, alis lineis interiore et exteriore nigricantibus angulosis, linea media fusca recta apud costam flexa, alis anticis linea basali angulosa nigricante, linea submarginali pallida lata subundulata, litura costali alba.

Female. Fawn-colour. Palpi vertical, hardly rising higher than the head; 3rd joint extremely minute. Legs, partly, and pectus pure white. Wings ample; interior and exterior lines blackish, zigzag; middle line less distinct, brown, oblique, and straight, except towards the costa of the fore wings; fringe dark brown. Fore wings hardly falcate, with a blackish zigzag basal line; exterior line terminating in a white costal mark; submarginal line broad, slightly undulating, a little paler than the ground-hue. Length of the body 9 ? lines; of the wings 24 lines.

Gen. Daona, n. g.

Fœm. Corpus sat robustum. *Proboscis* brevis. *Palpi* compressi, verticem longe superantes; articulus 2us obliquus, subfimbriatus; 3us erectus, 2° non brevior. *Antennæ* glabræ. *Abdomen* alas posticas non superans. *Pedes* læves; tibiæ posticæ apice fimbriatæ, calcaribus quatuor longissimis. *Alæ* anticæ acutæ, costa recta, margine exteriore subconvexo subobliquo.

Female. Body moderately stout. Proboscis short. Palpi compressed. ascending much higher than the vertex; 2nd joint oblique, slightly fringed; 3rd erect, as long as the 2nd. Antennæ bare. Abdomen not extending beyond the hind wings. Legs smooth, moderately stout; hind tibiæ fringed towards the tips, with four very long spurs. Wings moderately broad. Fore wings acute; costa straight; exterior border slightly convex and oblique.

This genus has some affinity to the *Herminidæ*.

446. Daona mansueta, n. s. *Fœm.* Pallidissime cervina, alis subconspersis, linea exteriore subobscuriore subundulata, margine exte-

riore fuscescente, costa subtus rufescente, alis anticis fascia cervina, linea submarginali fuscescente subrecta, punctis duobus discalibus nigris.

Female. Very pale fawn-colour. Wings slightly speckled, brownish along the exterior border; marginal festoon blackish; exterior line slightly undulating, a little darker than the ground-hue; under side pale reddish along the costa. Fore wings with a slight fawn-coloured band along the inner side of the exterior line; submarginal line brownish, nearly straight; marginal points black; two black discal points. Length of the body $3\frac{1}{2}$ lines; of the wings 9 lines.

Gen. Vescisa, n. g.

Mas. Corpus sat robustum. *Proboscis* conspicua. *Palpi* compressi, verticem paullo superantes; articulus 2us subfimbriatus; 3us conicus, minimus. *Antennæ* vix setulosæ. *Abdomen* alas posticas non superans; fasciculus apicalis minimus. *Pedes* sat validi. *Alæ* breviusculæ, latiusculæ, margine exteriore subangulato; anticæ acutæ, costa vix convexa, margine exteriore antico inciso.

Male. Body moderately stout. Frontal tuft prominent. Proboscis distinct. Palpi compressed, moderately broad, ascending a little higher than the vertex; 2nd joint slightly fringed; 3rd conical, not more than one-sixth of the length of the 2nd. Antennæ nearly imperceptibly setulose. Abdomen not extending beyond the hind wings; apical tuft very small. Legs moderately stout. Wings rather short and broad. Fore wings acute; costa hardly convex; exterior border slightly angular in the middle, with two excavations in the fore part, rather oblique hindward. Hind wings slightly angular.

447. Vescisa commoda, n. s. *Fœm.* Pallide cinerea, æneo-albido subtincta, capite thoraceque antico fuscis, alis linea exteriore fuscescente informi interrupta apud costam flexa et dilatata, lineis duabus adhuc exterioribus e punctis nigricantibus, linea submarginali denticulata pallide cinerea valde indistincta, alis anticis macula costali subapicali ferruginea nigricante et cinereo notata, alis posticis macula apud angulum interiorem magna nigra.

Female. Pale cinereous, with a slight whitish æneous tinge. Head and fore part of the thorax brown. Wings with the exterior line brownish, irregular, incomplete, bent and dilated towards the costa; two more exterior lines of blackish points; submarginal line pale cinereous, denticulated, very indistinct; marginal points brown. Fore wings with elongated black costal points, and with a ferruginous costal subapical spot which is marked with blackish and with cinereous. Hind wings with a cluster of ferruginous speckles in the disk, and with a large black spot by the interior angle. Length of the body $3\frac{1}{2}$ lines; of the wings 9 lines.

Gen. Ausinza, n. g.

Fœm. Corpus sat robustum. *Proboscis* conspicua. *Palpi* porrecti, rostriformes, caput longe superantes; articulus 2us supra convexus; 3us minimus. *Antennæ* graciles. *Abdomen* alas posticas non superans. *Pedes* læves. *Alæ* brevinsculæ, latinsculæ; anticæ acutæ, costa recta, margine exteriore vix flexo, postice obliquo.

Female. Body rather stout. Proboscis distinct. Palpi porrect, rostriform, extending much beyond the head; 2nd joint convex above; 3rd extremely minute. Antennæ slender. Abdomen not extending beyond the hind wings. Legs smooth, moderately stout; spurs long. Wings rather short and broad. Fore wings acute; costa straight; exterior border hardly bent, oblique hindward.

448. Ausinza æqua, n. s. *Fœm.* Cervina, alis nigro conspersis, lineis interiore et exteriore pallide cinereis rectis obliquis parallelis, linea submarginali valde indistincta, punctis marginalibus pallidis.

Female. Fawn-colour, paler and with a cinereous tinge beneath. Wings minutely black-speckled; interior and exterior lines pale cinereous, straight, oblique, parallel; submarginal line very indistinct; marginal points black; marginal line pale. Length of the body $2\frac{1}{2}$ lines; of the wings 7 lines.

Gen. Astygisa, n. g.

Mas. Corpus sat robustum. *Proboscis* conspicua. *Palpi* validi, caput paullo superantes; articulus 2us oblique ascendens; 3us conicus, parvus. *Antennæ* pectinatæ, apices versus simplices. *Pedes* læves, sat graciles, calcaribus longissimis. *Alæ* anticæ amplæ, acutæ, costa margineque exteriore subconvexis; posticæ abdomen superantes, angulo interiore producto.

Male. Body moderately stout. Proboscis distinct. Palpi stout, extending a little beyond the head; 2nd joint obliquely ascending; 3rd conical, porrect, less than one-fourth of the length of the 2nd. Antennæ moderately pectinated to much beyond half the length. Legs smooth, rather slender; spurs very long. Wings ample. Fore wings acute; costa and exterior border very slightly convex, the latter moderately oblique. Hind wings extending beyond the abdomen; interior angle prominent.

449. Astygisa larentiata, n. s. *Mas.* Cinereo-ferruginea, alis lineis basali et interiore obscurioribus undulatis, lineis exteriore et submarginali subundulatis, alis anticis basi plagaque subapicali lituraque discali indistincta ferrugineis, alis posticis puncto discali albo.

Male. Ferruginous with a cinereous tinge, the latter hue more prevalent on the under side. Wings with the basal and interior lines darker ferruginous, undulating; exterior and submarginal lines almost undulating. Fore wings darker and with fawn-coloured streaks along the

costa; a ferruginous subapical patch and some whitish apical marks; base ferruginous; interior line emitting a streak to the disk in front; an indistinct ferruginous discal mark. Hind wings with a white discal point. Length of the body 6 lines; of the wings 16 lines.

450. Astygisa metaspila, n. s. *Mas.* Rufescenti-fusca, subtus cinerea, antennis subpectinatis apice glabris, alis amplis e lituris transversis albidis vix bifasciatis, alis anticis gutta discali rotunda alba.

Male. Reddish brown, cinereous beneath. Palpi slightly ascending; 3rd joint linear, rounded at the tip, about one-third of the length of the 2nd. Antennæ slightly pectinated to beyond half the length. Legs slender, smooth. Wings ample, with transverse whitish speckles, which are most prevalent in the fore wings, especially along the costa, and form two irregular bands. Hind wings with a round white discal spot. Length of the body 5 lines; of the wings 14 lines.

Gen. Murgisa, n. g.

Mas. Corpus vix robustum. *Proboscis* conspicua. *Palpi* longi, erecti, fimbriati, verticem longe superantes; articulus 3us lanceolatus, 2^i^ dimidio non longior. *Antennæ* pectinatæ. *Abdomen* alas posticas vix superans. *Pedes* sat graciles, femoribus tibiisque subfimbriatis, calcaribus longis. *Alæ* amplæ, fimbria subdentata; anticæ acutæ, costa vix convexa, basi fimbriata, margine exteriore convexo sat obliquo.

Male. Body hardly stout. Proboscis distinct. Palpi long, erect, fringed, ascending high above the head; 3rd joint lanceolate, about half the length of the 2nd. Antennæ moderately pectinated; the branches very short towards the tips. Abdomen hardly extending beyond the hind wings. egs rather slender; femora and tibiæ slightly fringed; spurs long. Wings ample; fringe slightly notched. Fore wings acute; costa hardly convex, fringed towards the base; exterior border convex, rather oblique.

451. Murgisa orgyoides, n. s. *Mas.* Obscure fusca, palpis nigricantibus, alis cinereo subconspersis, lineis interiore et exteriore cinereis denticulatis albo variis, alis anticis macula marginali alba, fimbria antica albo quadrinotata, lunula discali nivea.

Male. Dark brown. Palpi blackish. Wings minutely and indistinctly speckled with cinereous; interior and exterior lines cinereous, denticulated, here and there white and more distinct. Fore wings with a large white spot on the middle of the exterior border; fore part of the fringe with four white elongated dots; discal lunule pure white. Length of the body 6½ lines; of the wings 15 lines.

Gen. Detounda, n. g.

Fœm. Corpus sat robustum. *Proboscis* valida. *Palpi* læves, subangulati, verticem non superantes; articulus 3us longiconicus, 2^i^ dimidio

non longior. *Antennæ* vix setulosæ. *Abdomen* alas posticas non superans. *Pedes* læves; calcaria longissima. *Alæ* anticæ latæ, rectangulatæ, costa vix convexa, margine exteriore recto vix obliquo.

Female. Body moderately stout. Proboscis robust, of moderate length. Palpi smooth, not rising higher than the vertex; 2nd joint obliquely ascending; 3rd joint elongate-conical, more porrect than the 2nd, and about half its length. Antennæ hardly setulose. Abdomen not extending beyond the hind wings. Legs smooth; spurs very long. Wings broad. Fore wings acutely rectangular; costa very slightly convex; exterior border straight, hardly oblique.

452. DETOUNDA SPURCATA, n. s. *Fœm.* Pallide subtestaceo-cinerea, capite antico fuscescente, alis anticis nigro conspersis, lineis duabus fuscescentibus indistinctis interruptis, alis posticis fuscescenti-cinereis lunula discali nigricante.

Female. Pale cinereous with a slight testaceous tinge. Head in front and palpi brownish. Fore wings with irregular black speckles; interior and exterior lines brownish, very indistinct and incomplete; under side brownish cinereous. Hind wings brownish cinereous, with a small blackish discal lunule; under side pale cinereous, speckled with black. Length of the body 5 lines; of the wings 12 lines.

Gen. BAGISTANA, n. g.

Mas. Corpus sat robustum. *Proboscis* conspicua. *Palpi* ascendentes, læves, graciles, lineares; articulus 3us 2° non brevior. *Antennæ* subsetulosæ, basi subincrassatæ. *Abdomen* alas posticas perpaullo superans; fasciculus apicalis depressus. *Pedes* læves, sat validi, calcaribus longissimis. *Alæ* latiusculæ, breviusculæ; anticæ apice subrotundatæ, costa subconvexa, margine exteriore recto, margine interiore fimbriato.

Male. Body moderately stout. Proboscis distinct. Palpi ascending, smooth, slender, linear; 3rd joint full as long as the 2nd. Antennæ minutely setulose, slightly incrassated near the base. Abdomen extending very little beyond the hind wings; apical tuft flat. Legs smooth, moderately stout; spurs very long. Wings rather broad and short. Fore wings slightly rounded at the tips; costa slightly convex; exterior border straight, moderately oblique; interior border fringed, slightly convex.

453. BAGISTANA RUDIS, n. s. *Mas.* Pallide testacea, abdomine apice subtus nigro, alis anticis fusco subconspersis, vitta obliqua nigricante, vitta exteriore nigricante late interrupta, alis posticis albidis.

Male. Pale testaceous. Abdomen black at the tip beneath. Fore wings indistinctly speckled with brown; a blackish oblique stripe proceeding from the base of the costa to the middle of the interior border; a more irregular and widely interrupted blackish stripe proceeding from the middle of the costa to the interior angle. Hind wings whitish. Length of the body 4 lines; of the wings 10 lines.

Gen. Dumatha, n. g.

Fœm. Corpus sat robustum. *Proboscis* conspicua. *Palpi* longi, læves, verticem superantes; articulus 3us lanceolatus, 2° non brevior. *Antennæ* glabræ. *Abdomen* alas posticas non superans. *Pedes* læves, sat validi, calcaribus longissimis. *Alæ* breviusculæ, latiusculæ; anticæ apice subrotundatæ, costa et margine interiore subconvexis, margine exteriore convexo.

Female. Body moderately stout. Proboscis of moderate length. Palpi long, smooth, obliquely ascending, rising higher than the vertex; 3rd joint lanceolate, as long as the 2nd. Antennæ smooth. Abdomen not extending beyond the hind wings. Legs smooth, moderately stout; spurs very long. Wings rather broad and short. Fore wings slightly rounded at the tips; costa and interior border slightly convex; exterior border convex.

This genus has some affinity to the *Tortricites*.

454. Dumatha herbida, n. s. *Fœm.* Viridis, corpore subtus albido, abdomine alisque posticis fuscis, alis anticis cinereo variis, lineis duabus albis subundulatis, fascia obliqua obscure viridi, guttis nigris lineaque alba submarginalibus, costa apicem versus margineque exteriore subtus rufescentibus.

Female. Grass-green. Body whitish beneath. Abdomen and hind wings brown. Fore wings varied with cinereous; interior and exterior lines white, slightly undulating, the latter intersecting an oblique dark green band; a row of black submarginal dots, mostly accompanied by a white line; under side blackish cinereous, reddish along the exterior part of the costa and about the exterior border. Length of the body 4 lines; of the wings 10 lines.

Gen. Badiza, n. g.

Mas. Corpus sat gracile. *Proboscis* conspicua. *Palpi* longiusculi, compressi, angulati, fimbriati; articulus 3us lanceolatus, 2^i^ dimidio non longior. *Antennæ* pectinatæ, apud medium serratæ et subincrassatæ. *Abdomen* longiusculum, alas posticas paullo superans; latera subfasciculata. *Pedes* longiusculi, sat graciles, femoribus tibiisque subfimbriatis, calcaribus longissimis. *Alæ* amplæ, subdentatæ; anticæ acutæ, costa recta, margine exteriore postico perobliquo.

Male. Body rather slender. Proboscis distinct. Palpi compressed, fringed, rather long; 2nd joint obliquely ascending; 3rd lanceolate, porrect, not fringed towards the tip, about half the length of the 2nd, with which it forms an angle. Antennæ pectinated; middle part serrated, slightly incrassated; branches slender, not long. Abdomen rather long, extending a little beyond the hind wings; sides slightly tufted; apical tuft small. Legs rather long and slender; femora and tibiæ slightly fringed; spurs very long. Wings ample, slightly dentate. Fore wings acute; costa straight; exterior border very oblique hindward.

455. Badiza ereboides, n. s. *Mas.* Fusca, subtus testaceo-cinerea, alis subconspersis, linea exteriore recta obliqua nigro-fusca cinereo marginata apud costam retracta, linea submarginali cinerea angulosa, alis anticis plaga marginali subapicali cervina, costa apicali nigricante, reniformi e macula subcostali nigricante.

Male. Brown, testaceous cinereous beneath. Wings minutely speckled; exterior line straight, oblique, blackish brown, cinereous-bordered, retracted towards the costa of the fore wings; submarginal line cinereous, zigzag; marginal lunules blackish brown; under side with the interior, exterior, and submarginal lines dentate, the 1st and 2nd brown, the 3rd cinereous, broadly bordered with brown. Fore wings with a subapical fawn-coloured patch on the exterior border; tip of the costa blackish; reniform mark represented by a blackish spot near the costa. Length of the body 7½ lines; of the wings 15 lines.

Addenda to the preceding Families.

Fam. LITHOSIIDÆ, *Steph.*

Gen. Mirobriga, n. g.

Mas. Corpus sat robustum. *Proboscis* conspicua. *Palpi* arcuati, breves, ad frontem applicati; articulus 3us minimus. *Antennæ* subsetulosæ. *Abdomen* lanceolatum, basi cristatum, apice compressum, alas posticas vix superans. *Pedes* vix pilosi, calcaribus longis. *Alæ* anticæ elongatæ, apice rotundatæ.

Male. Body moderately stout. Proboscis distinct. Palpi curved, hardly stout, with very short hairs, applied to the front, not ascending to the vertex; 3rd joint very minute. Antennæ minutely setulose. Abdomen lanceolate, crested towards the base, slightly compressed towards the tip, hardly extending beyond the hind wings; apical tuft very small and compressed. Legs rather stout, nearly bare; hind tibiæ with four long spurs. Wings elongate. Fore wings somewhat rounded at the tips; costa straight; exterior border slightly convex, very oblique.

The affinities of this genus are doubtful, and it hardly seems to be one of the *Lithosiidæ*.

456. Mirobriga pulchripicta, n. s. *Mas.* Ochracea, abdomine albido-cinereo, cristis apiceque ochraceis, alis luteo variis linea media cinerea dentata diffusa, linea exteriore interrupta cupreo conspersa, linea submarginali læte ochracea subrecta cupreo liturata, alis anticis cupreo triguttatis.

Male. Ochraceous, paler beneath. Abdomen mostly whitish cinereous, except the tufts and the tip. Wings partly luteous; middle line dark cinereous, dentate, diffuse; exterior line less distinct, interrupted, with cupreous speckles; submarginal line bright ochraceous, nearly

straight, accompanied by little clusters of cupreous speckles; marginal points black, elongated into slender streaks. Fore wings with three convex cupreous dots, one occupying the place of the orbicular mark, the other two that of the reniform. Length of the body $6\frac{1}{2}$ lines; of the wings 16 lines.

Fam. NOTODONTIDÆ, *Steph.*

Gen. Stauropus, *Germar.*

457. Stauropus? indeterminatus, n. s. *Mas.* Albido-cinereus, antennis late pectinatis, abdomine alas posticas paullo superante; alis anticis nigro subconspersis, apice subrotundatis, lineis tribus fuscescentibus undulatis indistinctis, reniformi ex annulo interrupto, margine exteriore perobliquo.

Male. Whitish cinereous. Antennæ broadly pectinated. Abdomen extending a little beyond the hind wings. Legs moderately stout, spurs long. Wings moderately broad. Fore wings slightly black-speckled, slightly rounded at the tips; interior, exterior, and submarginal lines brownish, undulating, indistinct, except by the costa, where there are other brown marks; submarginal points black; reniform mark represented by an incomplete ringlet; costa straight; exterior border very oblique. Length of the body 7 lines; of the wings 16 lines.

Gen. Felia, n. g.

Fœm. Corpus sat robustum. *Proboscis* gracilis. *Palpi* verticem non attingentes; articulus 2us validus, arcuatus; 3us minimus. *Antennæ* glabræ, setaceæ, submoniliformes; articulus 1us incrassatus. *Abdomen* alas posticas non superans. *Pedes* validi; tibiæ pilosæ; calcaria quatuor, brevia. *Alæ* anticæ longæ, amplæ, apice rotundatæ, costa vix convexa, margine exteriore subconvexo perobliquo.

Female. Body moderately stout. Proboscis slender. Palpi not rising so high as the vertex; 2nd joint stout, curved; 3rd extremely minute. Antennæ smooth, setaceous, submoniliform; basal joint incrassated. Abdomen not extending beyond the hind wings. Legs stout; tibiæ pilose; hind tibiæ with four short spurs. Wings long, ample. Fore wings rounded at the tips; costa hardly convex; exterior border slightly convex, very oblique.

458. Felia intermixta, n. s. *Fœm.* Cervina, nigro et cinereo conspersa, abdominis segmentis nigro marginatis, alis cinereis nigro conspersis, fasciis duabus cervinis lineisque duabus nigris undulatis, alis anticis macula costali cervina nigro notata, alis posticis fascia interiore nigro diffuse marginata.

Female. Fawn-colour, speckled with black and with cinereous, cinereous beneath. Thorax speckled with black. Hind borders of the abdominal segments black. Wings cinereous, black-speckled, with

two undulating fawn-coloured bands, which are accompanied by black equally undulating lines; marginal line black, festooned. Fore wings with an intermediate fawn-coloured costal black-marked spot. Hind wings with the inner band diffusedly black-bordered. Length of the body 6 lines; of the wings 18 lines.

On the Species of *Mitridæ* found in the Seas of Japan.

By Arthur Adams, F.L.S., &c.

[Read Dec. 3, 1863.]

The shores of the Japanese Islands which are washed by the Pacific are most prolific in species of *Mitridæ*. Towards the north, in the Sea of Japan, I met with no member of the family. A few new species are here described, and a systematic list of all the species which were actually obtained by me in those seas is given.

Fam. MITRIDÆ.

A. Mitrinæ.

1. Mitra, *Lam.*

1. Mitra impressa, *Anton, Kuster. Conch. Cab.* pl. 14. f. 6, 7; *Rve.* sp. 250.

Hab. Japan (*Siebold*).

2. Mitra floccata, *Rve. Conch. Icon.* sp. 16.

Hab. Mososeki.

3. Mitra sacerdotalis, *A. Ad. Proc. Zool. Soc.* 1851, p. 138.

Hab. Kino-O-Sima.

4. Mitra Japonica, *A. Ad.*

M. testa turrito-fusiformi, albida, rufo maculata et variegata, spira qua apertura longiore; anfractibus 9, convexis, plicis longitudinalibus confertis lirisque transversis decussatis; apertura angusta; labio plicis quatuor validis obliquis instructo; labro postice subangulato, margine in medio recto.

Hab. Kino-O-Sima.

The decussation of the small longitudinal plicæ and transverse liræ give this species a granular surface. The colour is dingy white, stained and mottled with rufous.

2. Scabricula, *Swains.*

1. Scabricula scabricula, *L.* (Voluta scabricula, *L. Syst. Nat.* ed. 12. p. 1192.—Mitra scabricula, *Rve.* sp. 35.—M. granatina, *Lam.*)

Hab. Kino-O-Sima.

2. Scabricula pretiosa, *Rve.* (Mitra pretiosa, *Rve. Conch. Icon.* sp. 116.)
Hab. Kuro-Sima.

3. Scabricula asperulata, *A. Ad.* (Mitra asperulata, *A. Ad. Proc. Zool. Soc.* 1851, p. 136.
Hab. Gotto, 71 fathoms.

4. Scabricula puncto-lirata, *A. Ad.*
S. testa fusiformi, fulva; anfractibus 6, planis, transversim liratis, liris planatis, regularibus, æqualibus, longitudinaliter sulcatis, interstitiis valde punctatis, suturis profundis; apertura angusta, labio plicis tribus validis obliquis instructo, labro margine intus sulcato.
Hab. Gotto Islands, 48 fathoms.
A small fulvous species with flat lirate whorls, the intervals between the liræ being very coarsely punctate.

3. Cancilla, *Swains.*

1. Cancilla circulata, *Kien.* (Mitra circulata, *Kien. Icon. Coq. viv.* pl. 5. f. 13.
Hab. Mino-Sima.

2. Cancilla carnicolor, *Rve.* (Mitra carnicolor, *Rve. Conch. Icon.* sp. 164. —M. pura, *A. Ad.* (blanched specimens) *Proc. Zool. Soc.* 1851, p. 136.
Hab. Tsu-Sima, 26 fathoms.

3. Cancilla rosacea, *Rve.* (Mitra rosacea, *Rve. Conch. Icon.* sp. 321.)
Hab. Kuro-Sima, 51 fathoms.

4. Cancilla straminea, *A. Ad.* (Mitra straminea, *A. Ad. Proc. Zool. Soc.* 1851, p. 132.)
Hab. Seto-Uchi (Mososeki).

5. Cancilla Herklotsiana, *Dohrn.* (Mitra Herklotsiana, *Dohrn, Malak. Blätt.* 1861.)
Hab. Japan (*Herklots*).

4. Mitreola, *Swains.*

1. Mitreola ignobilis, *Rve.* (Mitra ignobilis, *Rve. Conch. Icon.* sp. 152.
Hab. Mososeki.

5. Strigatella, *Swains.*

1. Strigatella amphorella, *Lam.* (Mitra amphorella, *Lam. Hist. Anim. s. Vert.* vol. vii. p. 316; *Rve. Conch. Icon.* sp. 85.)
Hab. Japan, teste Dunker.

2. Strigatella scutulata, *Chemn.* (Voluta scutulata, *Chemn.*—Mitra scutulata, *Lam. Hist.* vol. vii. p. 314; *Rve. Conch. Icon.* sp. 82.—Voluta pica, var., *Chemn.*)

6. Cylindra, *Schum.*

1. Cylindra undulosa, *Rve.* (Mitra undulosa, *Rve. Conch. Icon.* sp. 193.)
Hab. Kino-O-Sima.

B. Turriculinæ.

1. Costellaria, *Swains.*

1. Costellaria cithara, *Rve.* (Mitra cithara, *Rve. Conch. Icon.* sp. 248.)
Hab. Kino-O-Sima.

2. Costellaria militaris, *Rve.* (Mitra militaris, *Rve. Conch. Icon.* sp. 236.)
Hab. Fat-si-jeu, 25 fathoms.

3. Costellaria zelotypa, *Rve.* (Mitra zelotypa, *Rve. Conch. Icon.* sp. 325.)
Hab. Kino-O-Sima.

4. Costellaria Suluensis, *Ad. & Rve.* (Mitra Suluensis, *Ad. & Rve. Moll. Voy. Sam.* pl. 10. f. 27.)
Hab. Kino-O-Sima.

5. Costellaria semicostata, *Anton.* (Mitra semicostata, *Küster. Conch.-Cab.* pl. 14. f. 20, 21.)
Hab. Mososeki.

6. Costellaria cruentata, *Chemn.* (Voluta cruentata, *Chemn. Conch.-Cab.* vol. x. p. 171, tab. 151. f. 1438–39.—Mitra harpæformis, *Lam.*)
Hab. Japan, teste Dunker.

7. Costellaria pusilla, *A. Ad.* (Mitra pusilla, *A. Ad. Proc. Zool. Soc.* 1851, p. 141.)
Hab. Gotto, 48 fathoms; Uraga, 17 fathoms.

8. Costellaria bellula, *A. Ad.* (Mitra bellula, *A. Ad. Proc. Zool. Soc.* 1851, p. 138.)
Hab. Gotto, 48 fathoms.

9. Costellaria Collinsoni, *A. Ad.*
C. testa turrito-fusiformi, castanea, fascia fulva transversa in medio anfractuum ornata, spira elata conoidali quam apertura longiore; anfractibus 9, planis, longitudinaliter costatis, costis mediocribus, distantibus, interstitiis transversim valde sulcatis; apertura angusta, labio plicis tribus obliquis instructo, labro intus lirato ad marginem lævi.
Hab. Kino-O-Sima.

I have named this pretty species after John Collinson, Master R.N., my frequent companion in my Japanese wanderings, and a most assiduous and able collector.

10. Costellaria Dohrni, *A. Ad.*
C. testa turrito-fusiformi, grisea, irregulariter rufo maculata et variegata, spira quam apertura longiore; anfractibus 9, planis, longitudinaliter plicato-costatis, costis distantibus, postice nodoso-angulatis, interstitiis transversim valde sulcatis; apertura angusta, plicis quinque obliquis instructa, labro intus lirato prope marginem lævi.
Hab. Kino-O-Sima.

This is an elegant species, somewhat resembling *Mitra fusiformis*, Kien. The ribs are conspicuously nodulous at the hind part of the whorls.

2. Pusia, *Swains.*

1. Pusia analogica, *Rve.* (Mitra analogica, *Rve. Conch. Icon.* sp. 293.)
Hab. Gotto, 48 fathoms.

2. Pusia amabilis, *Rve.* (Mitra amabilis, *Rve. Conch. Icon.* sp. 274.)
Hab. Kino-O-Sima.

3. Pusia dermestina, *Lam.* (Mitra dermestina, *Lam. Hist. An. s. Vert.* vol. vii. p. 323; *Rve.* sp. 143.—Mitra pisolina, *Lam.*)
Hab. Awa-Sima; Tsaulian.

4. Pusia cavea, *Rve.* (Mitra cavea, *Rve. Conch. Icon.* sp. 149.)
Hab. Kino-O-Sima.

5. Pusia rubra, *Brod.* (Mitra rubra, *Brod. Proc. Zool. Soc.* 1835; *Rve. Conch. Icon.* sp. 286.)
Hab. Uraga, 17 fathoms.

6. Pusia Kraussii, *Dkr.* (Mitra Kraussii, *Dkr. Moll. Japon.* p. 8.)
Hab. Japan (*Dunker*).

7. Pusia Bronni, *Dkr.* (Mitra Bronni, *Dkr. Moll. Japon.* p. 8.)
Hab. Japan (*Dunker*).

3. Callithea, *Swains.*

1. Callithea obeliscus, *Rve.* (Mitra obeliscus, *Rve. Conch. Icon.* sp. 107.)
Hab. Kino-O-Sima.

2. Callithea crebrilirata, *Rve.* (Mitra crebrilirata, *Rve. Conch. Icon.* sp. 92.)
Hab. Satanomosaki, 55 fathoms.

3. Callithea spreta, *A. Ad.*
C. testa fusiformi, pallide fusca, spira quam apertura longiore; anfractibus 7, convexiusculis, plicis costelliformibus longitudinalibus confertis et liris transversis validis decussatis, suturis canaliculatis infra marginatis; apertura angusta, labio plicis duabus obsoletis instructo.
Hab. Mino-Sima, 63 fathoms.

A small pale-brown species, with the whorls decussated by fine longitudinal ribs and strong transverse liræ.

Catalogue of the Dipterous Insects collected in Waigiou, Mysol, and North Ceram by Mr. A. R. Wallace, with Descriptions of New Species. By Francis Walker, Esq., F.L.S.

[Read Feb. 5, 1863.]

Mysol.

Fam. BIBIONIDÆ, *Haliday*.

Gen. Plecia, *Hoffmansegg*.

1. Plecia dorsalis, *Walk*. See Vol. I. p. 5.

Fam. CULICIDÆ, *Haliday*.

Gen. Megarhina, *Desvoidy*.

2. Megarhina immisericors, *Walk*. See Vol. IV. p. 90.

Gen. Culex, *Linn*.

3. Culex obturbans, *Walk*. See Vol. IV. p. 91.

Fam. TIPULIDÆ, *Haliday*.

Gen. Limnobia, *Meigen*.

Div. Wings with two discal areolets; veins complete, not forked; the usual transverse veinlet between the second and third externo-medial veins.

4. Limnobia auroratra, n. s. *Fœm.* Atra, antennis capite duplo longioribus, alis nigris, fascia ochracea bipunctata, gutta subcostali alba.

Female. Deep black, rather stout. Antennæ about twice the length of the head. Abdomen less than twice the length of the thorax. Legs long. Wings black, with a broad bright ochraceous band, which is slightly dilated on the costa and on the hind border; two blackish points on the exterior part of the band, one costal, the other on the hind border; a white subcostal dot near the exterior border of the band. Length of the body 5 lines; of the wings 12 lines.

Div. Wings with a discal areolet; veins complete; cubital vein forked; the usual transverse veinlet between the second and third externo-medial veins.

5. Limnobia selectissima, n. s. *Mas.* Ochracea, capite nigro, antennis thorace vix brevioribus, abdomine lineis duabus anticis apiceque nigris, pedibus fuscis, femoribus flavescentibus apice nigris, alis cinereis, venis nigro marginatis, halteribus ochraceis apice nigris.

Male. Ochraceous, slender. Head black. Antennæ black, ochraceous at the base, nearly as long as the thorax. Thorax very short, slightly attenuated in front. Abdomen broader hindward, with a black line along each side from the base to the middle; tip black. Legs brown, slender; femora dull yellowish, with black tips; tibiæ and tarsi minutely setulose. Wings cinereous, with black veins, which have black borders; these are very broad along the costa, and thus the surface appears to be reticulated; halteres ochraceous, with black tips. Length of the body 5 lines; of the wings 9 lines.

Gen. Gymnoplistia, *Westw.*

6. Gymnoplistia melancholica, n. s. *Mas et Fœm.* Nigra, capite subochracco, pedibus piceo-nigris, alis cinereis. *Mas.* Abdomine fasciis flavis, alis apud costam nigricantibus nigro bimaculatis. *Fœm.* Alis, costa fasciisque tribus nigricantibus.

Male and Female. Black. Head dull ochraceous. Antennæ brownish, pale at the base, very broadly pectinated in the male. Abdomen of the male with yellow bands, except towards the tip. Legs piceous black. Wings cinereous; veins black. *Male.* Wings blackish along the costa and at the tips; two black spots extending from the costa to the disk. *Female.* Wings with the costa, the tips, and three broad bands blackish; 1st and 2nd bands connected. Length of the body 6–7 lines; of the wings 13–14 lines.

Nearly allied to *G. fulviceps* and to *G. jurgiosa.*

Fam. STRATIOMIDÆ, *Haliday.*

Gen. Stratiomys, *Geoffr.*

7. Strutiomys restricta, n. s. *Mas.* Nigra, antennis parvis basi flavescentibus, thorace pectoreque subaurato tomentosis, scutello spinis duabus flavescentibus, abdomine flavescente maculis quatuor nigris angulatis subconvexis, pedibus flavescentibus, alis albide limpidis.

Male. Black. Antennæ yellowish towards the base, shorter than half the breadth of the head. Thorax and pectus with slightly gilded tomentum. Scutellum with two yellowish spines. Abdomen yellowish green (in the living state), with four black, angular, nearly connected spots. Legs yellowish. Wings whitish limpid; veins pale yellow. Length of the body 4 lines; of the wings 6 lines.

Gen. Salduba, *Walk.*

8. Salduba gradiens, n. s. *Fœm.* Nigra, obscura, capite nitente, antennis basi rufescentibus, thorace vittis duabus cinereis, abdomine suturis apiceque nitentibus, pedibus rufescentibus, tibiis apice nigris, tarsis albidis apice nigris, alis nigricantibus, halteribus rufescentibus.

Female. Black, dull, most nearly allied to *S. singularis*. Head shining. Antennæ reddish towards the base. Thorax with two indistinct cinereous stripes. Abdomen shining on the sutures and at the tip. Legs reddish; tibiæ with black tips; tarsi whitish, with black tips. Wings blackish; veins black; halteres reddish. *Var.* Smaller; legs darker. Length of the body 3–4 lines; of the wings 5–7 lines.

9. Salduba areolaris, n. s. *Mas.* Nigra, obscura, thoracc vittis quatuor cinereis, pectore abdomineque nitentibus, hoc clavato, pedibus flavis, femoribus tibiisque posticis nigris, alis cinereis nebulosis, halteribus albidis.

Male. Black, dull, most nearly allied to *S. hilaris* and to *S. diphysoides*. Antennæ longer than the breadth of the head. Thorax with four cinereous stripes; the middle pair connected on the scutellum. Pectus and abdomen shining, the latter clavate. Legs yellow; tarsi black towards the tips; hind femora, except at the base and hind tibiæ, black. Wings cinereous, partly clouded with darker cinereous; veins black; halteres whitish. Length of the body 5½ lines; of the wings 9 lines.

Gen. Adraga, *Walk.*

10. Adraga univitta, *Walk.* See Vol. III. p. 82.

Gen. Obrapa, *Walk.*

11. Obrapa perilampoides, *Walk.* See Vol. III. p. 82.

Gen. Aulana, n. g.

Fœm. Clitellariæ affinis. *Corpus* sat latum. *Caput* thoracc antico paullo latius. *Antennæ* subsetaccæ, acutæ, thoracc vix breviores; articuli suturis indistinctis. *Thoraæ* antice productus et angustatus; scutellum magnum, longiconicum, subascendens. *Abdomen* breve, latum. *Pedes* inermes, breviusculi. *Alæ* mediocres.

Female. Body moderately broad. Head a little broader than the fore part of the thorax. Antennæ nearly as long as the thorax, slightly tapering from the base to the tips, which are acute; joints compact. Thorax convex, narrower in front; scutellum elongate-conical, very large and prominent, obliquely ascending. Abdomen slightly convex, much broader but not longer than the thorax. Legs unarmed, rather short. Wings with the veins much like those of *Clitellaria* in structure; areolet rhomboidal, with oblique transverse veinlets.

12. Aulana confirmata, n. s. *Fœm.* Nigra, vix nitens, cinereo subtomentosa, antennis basi fulvis, pedibus pallide flavis, femoribus nigris, tibiis posticis piceis, alis cinereis costa exteriore fusco nebulosa, halteribus niveis.

Female. Black, hardly shining, with slightly cinereous tomentum. Antennæ very much longer than the breadth of the head, tawny towards

the base. Legs pale yellow; femora mostly black; hind tibiæ mostly piceous. Wings cinereous, clouded with brown along the exterior part of the costa; veins black, tawny at the base; halteres pure white. Length of the body 3 lines; of the wings 6 lines.

Gen. Musama, n. g.

Fœm. Corpus breve, latum. *Caput* thorace non latius. *Antennæ* breves, subfusiformes, valde compactæ; arista longa, filiformis. *Thorax* convexus; scutellum subascendens, bispinosum. *Abdomen* subdepressum, thorace brevius et multo latius. *Pedes* inermes. *Alæ* mediocres.

Female. Body short, broad. Head as broad as the thorax. Antennæ, including the arista, rather more than half the breadth of the head; scape short; flagellum subfusiform, with very short and compact joints; arista filiform, much longer than the flagellum. Thorax convex; scutellum prominent, slightly ascending, armed with two apical spines. Abdomen rather flat, shorter and much broader than the thorax. Legs unarmed. Wings with the veins much like those of *Oxycera* in structure; discal areolet large.

13. Musama paupera, n. s. *Fœm.* Nigra, subnitens, antennis fulvis, arista alba, pedibus piceis, tarsis posterioribus albidis apice nigricantibus, alis cinereis, halteribus piceis.

Female. Black, short, broad, slightly shining. Antennæ tawny; arista white. Legs piceous; posterior tarsi whitish, with blackish tips. Wings cinereous; veins and halteres piceous. Length of the body 2 lines; of the wings 4 lines.

Gen. Sargus, *Fabr.*

14. Sargus quadrifasciatus, *Walk.* See Vol. V. p. 146.

Fam. TABANIDÆ, *Leach.*

Gen. Tabanus, *Linn.*

15. Tabanus exagens, n. s. *Mas.* Piceus, cinereo tomentosus, capite subtus pectoreque canis, antennis nigris cornu parvo acuto, thorace vittis quatuor canis, abdomine maculis trigonis et segmentorum marginibus canis, alis obscure cinereis.

Male. Piceous, with cinereous tomentum. Head beneath and pectus hoary. Eyes composed of very small facets. Antennæ black, with a small but acute horn; flagellum acute, curved, rather long. Thorax with four slight hoary stripes. Abdomen with a triangular hoary spot on each segment, whose hind border is also hoary. Wings dark cinereous; veins black; fore branch of the cubital vein rectangular near the base, where it rejects a short branch. Length of the body 7 lines; of the wings 14 lines.

16. Tabanus facilis, n. s. *Fœm.* Fulvus, capite antico albido, antennis rufis basi piceis articulo 3° apice nigro cornu parvo, thorace vittis quinque nigris, tarsis piceis, alis cinereis costam versus fuscescentibus, halteribus pallide luteis.

Female. Tawny. Head whitish in front; callus black, very slender. Proboscis black. Antennæ red, piceous at the base; 3rd joint curved, black towards the tip, with a small horn. Thorax with five black stripes, of which the outer pair are very short and slender. Tarsi piceous. Wings cinereous, mostly tinged with brown along the costa; veins black, tawny towards the base; fore branch of the cubital vein forming a rounded angle near the base, very slightly curved from thence to its tip; halteres pale luteous. Length of the body 8 lines; of the wings 16 lines.

17. Tabanus sylvioides, n. s. *Fœm.* Fulvus, capite subtus pectoreque canis, antennis apice nigris cornu brevissimo minimo, abdomine maculis trigonis subobsoletis et segmentorum marginibus canis, ventre tarsisque piceis, alis obscure cinereis, costa venisque fusco nebulosis.

Female. Tawny. Head beneath and pectus hoary. Callus between the eyes piceous, long, slender. Proboscis black. Antennæ slender, black towards the tips; horn of the flagellum extremely small and short. Abdomen elongate-conical, piceous beneath; hind borders of the segments hoary, each with a nearly obsolete triangular hoary dorsal spot. Tarsi piceous. Wings dark cinereous, brown along the costa and along the neighbouring veins; veins black, tawny at the base; fore branch of the cubital vein forming a rounded angle near its base, not forked; halteres piceous. Length of the body 6 lines; of the wings 14 lines.

Fam. ASILIDÆ, *Leach.*

Subfam. Laphrites, *Walk.*

Gen. Laphria, *Fabr.*

18. Laphria requisita, *Walk.* See Vol. IV. p. 105.

19. Laphria congrua, *Walk.* See Vol. V. p. 277.

20. Laphria consors, *Walk.* See Vol. III. p. 85.

21. Laphria flagrantissima, *Walk.* See Vol. III. p. 86.

22. Laphria germana, *Walk.* See Vol. III. p. 86.

23. Laphria puer, *Doleschall.* See Vol. V. p. 147.

24. Laphria divulsa, n. sp. *Fœm.* Nigra, obscura, oculis argenteo marginatis, mystace e setis nonnullis albis, antennis flagello sublineari, abdomine punctato guttis lateralibus transversis albidis, tibiis rufis apice nigris, alis nigricantibus basi cinereis, halteribus rufescentibus.

Female. Black, stout, dull. Face silvery along the eyes; mystax with a few white bristles. Antennæ a little shorter than the breadth of the head; flagellum nearly linear. Thorax slightly cinereous; pectus hoary. Abdomen minutely punctured; hind borders of the segments with a transversely elongated whitish dot on each side; underside cinereous. Legs stout, setose; tibiæ red, except towards the tips. Wings blackish, cinereous towards the base; veins black, with the usual structure; halteres reddish. Length of the body 5 lines; of the wings 8 lines.

Subfam. Asilites, *Walk.*

Gen. Trupanea, *Macq.*

25. Trupanea transacta, n. sp. *Fœm.* Nigra, robusta, capite cano pilis albidis, mystace e setis albidis nigrisque, thoracis vittis quinque scutello pectoreque cinereis, abdomine stylato segmentis cano marginatis, tibiis rufis apice nigris, alis fuscescenti-cinereis vitta subopaca, halteribus rufescentibus.

Female. Black, robust. Head hoary; hind part clothed with whitish hairs, and thickly beset with black bristles; underside thickly clothed with whitish hairs; epistoma very prominent; mystax with black bristles above, and with whitish bristles below. Thorax with five cinereous stripes; scutellum and pectus cinereous. Abdomen much narrower than the thorax; hind borders of the segments with hoary bands, which are most distinct on each side; underside cinereous; apical part stylate, compressed. Legs thick, bristly; tibiæ red, with black tips. Wings brownish cinereous; radial areolet with the usual cinereous somewhat opaque stripe; veins black; halteres reddish. Length of the body 11 lines; of the wings 16 lines.

Gen. Asilus, *Linn.*

26. Asilus depulsus, n. sp. *Mas.* Fuscus, capite subargenteo, mystace e setis flavescenti-albis, antennis nigris articulo 3° lanceolato, thorace vittis tribus flavescenti-cinereis, pectore cano, abdomine fulvo apice piceo, pedibus luteis, genibus posterioribus nigris, tarsis nigris basi luteis, alis cinereis apice nigricantibus, halteribus flavis.

Male. Brown. Head silvery whitish, clothed behind and beneath with white hairs; epistoma prominent; mystax composed of many yellowish-white bristles. Proboscis and palpi black. Antennæ black; 3rd joint lanceolate; arista a little longer than the 3rd joint. Thorax with three yellowish-cinereous stripes; sides and pectus hoary. Abdomen with bright tawny tomentum; tip piceous, red beneath; appendages much developed. Legs luteous, thick, with black spines; posterior knees black; tarsi black, luteous at the base; pulvilli luteous. Wings cinereous, blackish towards the tips; veins black; forks of the cubital vein undulating; 1st externo-medial vein slightly curved; 3rd joining

the 4th at some distance from the border; halteres yellow. Length of the body 10 lines; of the wings 16 lines.

27. Asilus didymoides, n. s. *Fœm.* Fuscus, *A. tenuicorni* valde affinis, capite argenteo, mystace e setis paucis nigris albisque, palpis luteis, antennis luteis articulo 3° nigro minimo, thoracis vittis tribus scutello pectoreque canis, abdomine fasciis cinereis apice nigro, pedibus fulvis, alis cinereis apice nigricantibus, halteribus pallide fulvis.

Female. Brown. Head silvery white, slightly clothed beneath with white hairs; epistoma convex; mystax composed of some black and white bristles. Eyes flat in front. Proboscis black, luteous at the base; palpi luteous. Antennæ black; 1st and 2nd joints luteous; 3rd conical, very small, not more than one-fourth of the length of the arista. Thorax with three hoary stripes; sides, scutellum, and pectus hoary. Abdomen nearly flat; hind borders of the segments cinereous; tip black, shining. Legs tawny, with a few black bristles. Wings cinereous, blackish towards the tips; veins black; forks of the cubital vein undulating; 3rd externo-medial vein joining the 4th at a short distance from the border; halteres pale tawny. Length of the body 8 lines; of the wings 16 lines.

Closely allied to the Celebes species *A. tenuicornis*; but the abdomen is broader and more flat, and the posterior femora have not black tips.

Gen. Ommatius, *Illiger.*

28. Ommatius noctifer, *Walk.* See Vol. III. p. 88.

29. Ommatius nanus, *Walk.* See Vol. V. p. 237.

30. Ommatius retrahens, *Walk.* See Vol. III. p. 88.

Gen. Leptogaster, *Meigen.*

31. Leptogaster longipes, *Walk.* See Vol. III. p. 89.

Fam. LEPTIDÆ, *Westw.*

Gen. Leptis, *Fabr.*

32. Leptis ferruginosa, *Wied.* See Vol. I. p. 118.

Gen. Chrysopila, *Macq.*

33. Chrysopila stylata, n. s. *Fœm.* Fulva, capite antennis pedibusque nigris, pectore argenteo, abdomine fasciis tribus apiceque stylato nigris, femoribus fulvis, alis subcinereis apices versus nigricantibus, arcolis margaritaceo maculatis.

Female. Tawny, nearly allied to *C. vacillans* and to *C. guttipennis.* Head and antennæ black. Pectus silvery. Abdomen with three black bands, black and stylate towards the tip. Legs black; femora and hind coxæ tawny; hind femora with black tips. Wings slightly cine-

reous, irregularly blackish towards the tips, the blackish part extending along the veins to the disk; hinder veins blackish-bordered; a pearly spot in each areolet, but only apparent in some aspects. Length of the body 5 lines; of the wings 8 lines.

Fam. BOMBYLIDÆ, *Leach.*

Subfam. Bombylites, *Walk.*

Gen. Anthrax, *Fabr.*

34. Anthrax Pelops, *Walk.* See Vol. III. p. 90.

Fam. EMPIDÆ, *Leach.*

Gen. Epiceia, *Walk.*

35. Epiceia ferruginea, *Walk.* See Vol. V. p. 149.

Fam. DOLICHOPIDÆ, *Leach.*

Gen. Psilopus, *Meig.*

36. Psilopus benedictus, *Walk.* See Vol. III. p. 91.

37. Psilopus lucigena, *Walk.* See Vol. III. p. 91.

38. Psilopus superans, *Walk.* See Vol. V. p. 150.

39. Psilopus subrectus, n. s. *Mas.* Læte viridis, cyaneo purpureoque varius, palpis antennis pedibus halteribusque flavis, abdomine fasciis nigris, femoribus posticis apice nigris, alis cinereis.

Male. Bright green, varied with blue and purple. Palpi and legs pale yellow. Antennæ pale yellow; arista black, somewhat shorter than the body. Abdomen bright green, mostly blue or purple towards the base; a black band on the base of each segment. Hind femora with black tips. Wings cinereous; veins black, tawny at the base; fore branch of the prebrachial vein much curved inward; discal transverse vein very slightly curved outward; halteres pale yellow. Length of the body 5 lines; of the wings 9 lines.

40. Psilopus moderatus, n. s. *Fœm.* Virideseenti-cyaneus, capite purpureo, palpis antennis pedibus halteribusque nigris, pectore cano, abdomine viridi, alis cinereis.

Female. Greenish blue, nearly allied to *P. abruptus*. Head purple. Palpi, antennæ, and legs black. Arista as long as the thorax. Thorax green hindward. Pectus hoary. Abdomen green. Tibiæ bristly. Wings cinereous; veins black; fore branch of the prebrachial vein much curved inward; discal transverse vein very slightly undulating; halteres black. Length of the body $2\frac{1}{2}$ lines; of the wings 5 lines.

Gen. Dolichopus, *Latr.*

41. Dolichopus pulchriceps, n. s. *Fœm.* Testaceus, capite supra purpureo, facie argentea, thorace vitta lata purpurea, alis cinereis.

Female. Testaceous, paler beneath, with black bristles. Head purple above; face silvery. Third joint of the antennæ minute, nearly round. Thorax with a broad purple stripe. Posterior tibiæ with two rows of black spines. Wings cinereous; veins black, straight, testaceous at the base; discal transverse vein very slightly curved outward. Length of the body $2\frac{1}{2}$ lines; of the wings $5\frac{1}{2}$ lines.

Gen. Diaphorus, *Meigen.*

42. Diaphorus resumens, *Walk.* See Vol. III. p. 93.

Fam. SYRPHIDÆ, *Leach.*

Gen. Eristalis, *Latr.*

43. Eristalis bomboides, *Walk.* See Vol. IV. p. 119.

44. Eristalis lucilioides, *Walk.* See Vol. V. p. 284.

45. Eristalis inscripta, *Doleschall.* See Vol. V. p. 151.

Var. β. *Male.* Black. Vertex blue; a broad silvery stripe on each side of the face. Antennæ reddish. Thorax with two oblique blue streaks on each side, and with two double blue stripes; scutellum bluish purple. Abdomen bluish purple at the base, with an anterior interrupted band which is dilated on each side; apical part gold-colour, with six elongated black spots, of which the two lateral pairs are oblique. Var. γ. *Male.* Thorax with purple stripes and streaks; hind part and scutellum tawny. Abdomen chalybeous bindward; spots brown.

46. Eristalis æquipars, n. s. *Mas.* Nigra, capite vittis duabus latis albido-cinereis, antennis rufescentibus, thorace vittis duabus cinereis fascia interrupta apiceque chalybeo-viridibus, abdomine subæneo-testaceo maculis septem elongatis fulvis disco basali nigro, pedibus nigris, alis cinereis, halteribus pallide testaceis.

Male. Black. Head with a broad, whitish-cinereous stripe on each side of the face. Antennæ reddish; arista bare. Thorax with two indistinct cinereous stripes, and with an interrupted chalybeous-green band; hind part and pectus chalybeous green. Abdomen testaceous, with a slight æneous tinge; base black, except on each side; seven elongated tawny spots, three dorsal and two on each side. Legs black. Wings cinereous; veins black; halteres pale testaceous. Length of the body 6 lines; of the wings 12 lines.

This may be a variety of *E. inscripta.*

47. Eristalis postscripta, n. s. *Mas.* Nigra, capite vittis duabus albido-cinereis, antennis rufescentibus, thorace chalybeo-viridi vittis

tribus anticis fasciaque nigris, abdomine fasciis duabus apiceque chalybeo-viridibus, fascia 2ª interrupta, vittis tribus posticis nigris, tarsis basi genibusque rufis, alis cinereis.

Male. Black. Head whitish-cinereous beneath, and with a whitish-cinereous stripe on each side of the face. Antennæ reddish; arista bare. Thorax chalybeous green, with three short black stripes in front, and with a black band at the base of the scutellum. Abdomen with two bands and the hind part chalybeous green; 1st band basal; 2nd widely interrupted; three black stripes on the hind part. Tarsi towards the base, and knees, dark red. Wings cinereous; veins black; stigma brown. Length of the body 4 lines; of the wings 9 lines.

48. Eristalis erythropyga, n. s. *Mas.* Obscure cyanea, facie albida, callo antico rufescente, antennis fulvis, thorace postico purpureo, abdomine rufescente basi nigro fasciis duabus cyaneo-purpureis, tibiis obscure rufis, tarsis piceis, alis cinereis, halteribus fulvis.

Male. Dark blue. Face with whitish tomentum, except along the callus, which is reddish in front. Antennæ tawny; arista bare. Thorax purple hindward. Abdomen reddish; basal part black, with two bluish-purple bands; second band interrupted in the middle, notched hindward on each side. Tibiæ dark red. Tarsi piceous. Wings cinereous; veins black; halteres tawny. Length of the body $4\frac{1}{2}$ lines; of the wings 10 lines.

49. Eristalis placens, n. sp. *Fœm.* Nigra, capite cinereo antice testaceo, antennis fulvis, thorace vittis quinque canis, scutello lateribusque fulvis, pectore strigis duabus obliquis testaceis, abdomine fasciis duabus maculisque quatuor obliquis punctisque duobus testaceis, segmentis chalybeo marginatis, pedibus halteribusque testaceis, femoribus nigro fasciatis, alis limpidis, costa nigro bipunctata.

Female. Black. Head cinereous; fore part testaceous, with paler tomentum. Antennæ tawny; arista bare. Thorax with five hoary stripes. Sides and scutellum tawny. Pectus hoary in front, with an oblique testaceous streak on each side. Abdomen with two testaceous bands near the base; 2nd band slightly interrupted, dilated on each side; hind borders and sides of the segments chalybeous; 3rd and 4th segments with an oblique testaceous spot on each side; 5th with two testaceous points. Legs testaceous; femora with black bands, which are broadest in the hind femora. Wings limpid; veins black, tawny towards the base; costa with two black points; halteres testaceous. Length of the body 6 lines; of the wings 10 lines.

Gen. Axona, n. g.

Mas. Corpus subfusiforme. *Caput* breviconicum. *Oculi* maximi. *Antennæ* brevissimæ; articulus 3ᵘˢ rotundus; arista nuda. *Abdo-*

men thorace paullo angustius. *Pedes* sat graciles. *Alæ* acutæ, vena cubitali valde flexa, vena anali subundulata.

Male. Body subfusiform. Head prominent, short conical, very little narrower than the thorax; front and epistoma convex. Eyes very large. Ocelli nearly contiguous, seated on a slight protuberance of the hind border. Antennæ very short; 3rd joint round; arista bare. Abdomen a little longer than the thorax. Legs rather slender. Wings acute; cubital vein very deeply bent; veinlet at the base of the subapical areolet curved outward; anal vein slightly undulating.

50. Axona volucelloides, n. sp. *Mas*. Purpurascenti-cyanea, facie vittis duabus argenteis, antennis nigris, thorace disco antico nigro vittis duabus argenteis, abdomine apicem versus fulvo, tibiis basi tarsisque piceis, alis cinereis, vitta lata costali fusca, halteribus pallide testaceis.

Male. Purplish blue. Face with two lateral silvery stripes which are dilated towards the epistoma. Antennæ black. Thorax with the middle fore part black, silvery along the fore border, and with two silvery stripes. Abdomen tawny towards the tip and on each side of the 3rd segment; underside tawny along each side. Tibiæ towards the base, and tarsi, piceous. Wings cinereous, with a broad brown costal stripe, which does not extend to the tips, and is interlined hindward; veins black; halteres pale testaceous. Length of the body 10 lines; of the wings 20 lines.

Gen. Syrphus, *Fabr.*

51. Syrphus ægrotus, *Fabr.* See Vol. I. p. 124.

52. Syrphus cricetorum, *Fabr.* See Vol. III. p. 97.

Gen. Baccha, *Fabr.*

53. Baccha tripartita, *Walk.* See Vol. V. p. 285.

54. Baccha purpuricola, *Walk.* See Vol. III. p. 129.

Mas? Fulva, capite antico pallide flavo-subchalybeo, antennis testaceis, thoracis disco obscuro, pectore strigis duabus transversis pallide flavis, abdomine fasciis tribus fuscescentibus apicem versus purpurascente, femoribus posticis fuscescente fasciatis, alis obscure fuscis basi cinereis.

Male? Tawny. Head in front pale yellow with a slight chalybeous tinge. Antennæ testaceous. Thorax with a black disk; pectus with a transverse pale yellow streak on each side in front. Abdomen with three brownish bands on the fore part, which is petiolated; apical part broad, purplish. Femora yellowish, hind femora with a brownish band. Wings dark brown, cinereous at the base. Length of the body 6 lines; of the wings 14 lines.

Fam. MUSCIDÆ, *Latr.*

Subfam. TACHINIDES, *Walk.*

Gen. MASICERA, *Macq.*

55. MASICERA MYSOLANA, n. s. *Fœm.* Nigra, capite argenteo, frontalibus atris, oculis pubescentibus, thorace cinereo vittis quatuor nigris, abdomine longe ovato albido vix tessellato apicem versus nigro nitente, alis cinereis.

Female. Black, thickly beset with black bristles. Head silvery; frontalia deep black, linear; facialia without bristles; epistoma not prominent. Eyes pubescent. Antennæ extending to the epistoma; 3rd joint linear, about six times the length of the 2nd; arista slender, very much longer than the 3rd joint. Thorax and pectus with cinereous tomentum; the former with four indistinct black stripes. Abdomen elongate-oval, a little longer than the thorax, with glistening whitish tomentum, hardly tessellated; apical part black, shining. Wings cinereous; veins black; præbrachial vein forming a rounded, hardly oblique angle at its flexure; discal transverse vein slightly undulating, parted by much less than its length from the border and from the flexure of the præbrachial vein. Length of the body 5 lines; of the wings 10 lines.

Gen. EURYGASTER, *Macq.*

56. EURYGASTER INTERDICTA, n. s. *Fœm.* Nigra, lata, brevis, capite cinereo subtus albido, frontalibus atris, thoracc antico cinereo vittis quatuor nigris, scutello albido, abdominis segmentis 3° 4°que rufescentibus, alis obscure cinereis basi nigricantibus, alulis albis.

Female. Black, broad, short, thickly beset with bristles. Head cinereous, whitish beneath; frontalia deep black, linear; facialia without bristles, except towards the epistoma, which is not prominent. Eyes bare. Antennæ little more than half the length of the face; 3rd joint hardly thrice the length of the 2nd; arista long, slender. Thorax in front cinereous, with four slender black stripes; scutellum whitish. Abdomen not longer than the thorax; 3rd and 4th segments reddish, with whitish tomentum; 2nd segment slightly reddish on each side. Wings dark cinereous, blackish towards the base; veins black; præbrachial vein forming a well-defined obtuse angle at its flexure; discal transverse vein slightly undulating, parted by much less than its length from the border and from the flexure of the præbrachial vein; alulæ large, white. Length of the body 4 lines; of the wings 8 lines.

Gen. TRICHOPROSOPA, *Macq.*

57. TRICHOPROSOPA? DIVISA, n. sp. *Mas.* Nigra, gracilis, capite albido, vertice subaurato setis duabus longis, frontalibus atris, thorace vittis tribus cinereis subauratis, pectore strigis duabus obliquis subau-

ratis, abdomine longo subcylindrico maculis duabus anticis lividis, pedibus longis, tibiis posticis pallide piceis, alis angustis obscure cinereis apices versus nigricantibus.

Male. Black, slender, with black bristles. Head whitish, slightly gilded, with two long bristles on the hind border of the vertex; frontalia deep black, linear; facialia without bristles; epistoma slightly prominent. Eyes bare. Antennæ reaching the epistoma; 3rd joint linear, rounded at the tip, twice the length of the 2nd; arista slender, much longer than the 3rd joint. Thorax with three approximate cinereous slightly gilded stripes, of which the middle one is much broader than the others; pectus with an oblique slightly gilded streak on each side. Abdomen much longer than the thorax, nearly cylindrical, slightly thicker hindward, with a large livid spot on each side near the base; fore borders of the 2nd and 3rd segments and tip cinereous. Legs long; hind tibiæ pale piceous. Wings narrow, dark cinereous, blackish for nearly half the length from the tips; veins black; præbrachial vein forming an obtuse angle, and emitting a very short branch at its flexure, slightly undulating thence to its tip, which joins the cubital vein near the tip of the latter; discal transverse vein slightly undulating, parted by less than half its length from the border, and by more than half its length from the flexure of the præbrachial vein; alulæ pale cinereous. Length of the body 8 lines; of the wings 14 lines.

Subfam. Dexides, *Walk.*

Gen. Dexia, *Meigen.*

58. Dexia alulifera, *Walk.* See Vol. V. p. 157.

Gen. Prosena, *St. Farg.*

59. Prosena argentata, *Walk.* See Vol. III. p. 102.

Subfam. Sarcophagides, *Walk.*

Gen. Sarcophaga, *Meigen.*

60. Sarcophaga innotata, n. s. *Fœm.* Nigra, capite albido, frontalibus atris, thorace vittis duabus lateribus pectoreque cinereis, abdomine cano subtessellato, alis cinereis, alulis albis.

Female. Black. Head whitish; frontalia deep black, linear. Thorax with two cinereous stripes; sides and pectus also cinereous. Abdomen slightly tessellated with hoary, shining, notched patches. Wings cinereous; veins black; præbrachial vein forming a sharply formed right angle at its flexure, nearly straight thence to its tip; discal transverse vein very slightly undulating, parted by more than half its length from the border and from the flexure of the præbrachial vein; alulæ white. Length of the body 6 lines; of the wings 10 lines.

Subfam. Muscides, *Walk.*

Gen. Silbomyia, *Macq.*

61. Silbomyia costalis, *Walk.* See Vol. V. p. 159.

62. Silbomyia decrescens, n. s. *Mas.* Aurato-viridis, capite flavescenti-albo, vertice viridi, frontalibus atris, palpis antennisque nigris, pectore maculis duabus argenteis, abdomine basi suturisque cyaneo-purpureis, alis cinereis costam versus nigris.

Male. Golden green, nearly allied to *S. opulenta.* Head yellowish white; vertex green; frontalia deep black, linear, with bristles along each side; face very deeply grooved on each side. Proboscis, palpi, and antennæ black, the latter nearly reaching the epistoma. Pectus with a silvery-white spot on each side. Abdomen bluish purple at the base and along the sutures. Tibiæ and tarsi black. Wings cinereous, black along the costa; the blackish part extending diffusedly along the veins; veins black; præbrachial vein forming a slightly rounded and obtuse angle at its flexure, slightly curved inward thence to its tip; discal transverse vein very slightly undulating, parted by a little more than half its length from the border and from the flexure of the præbrachial vein. Length of the body 5 lines; of the wings 10 lines.

Gen. Chrysomyia, *Desv.*

63. Chrysomyia divitiosa, n. s. *Fœm.* Purpurea, crassa, capite argenteo antice aurato, frontalibus atris, palpis piceis, antennis nigris, thorace antico cano vittis duabus albis, pectore maculis quatuor albis, abdomine fascia subapicali interrupta argentea, alis obscure cinereis basi nigris, halteribus piceis.

Female. Purple, broad, thick, with black bristles. Head silvery, brightly gilded in front; frontalia deep black, linear; epistoma prominent. Proboscis and antennæ black. Palpi piceous. Thorax hoary in front, with a white stripe on each side of the fore part. Pectus with two bright white spots on each side. Abdomen with a silvery interrupted subapical band. Tibiæ and tarsi black. Wings dark cinereous, black towards the base; veins black; præbrachial vein forming a hardly obtuse angle at its flexure, very slightly curved inward thence to its tip; discal transverse vein slightly undulating, parted by half its length from the border, and by more than half its length from the flexure of the præbrachial vein; alulæ cinereous; halteres piceous. Length of the body 7 lines; of the wings 14 lines.

Gen. Pyrellia, *Desv.*

64. Pyrellia porphyricola, n. s. *Mas.* Purpurea, palpis, antennis pedibusque nigris, thoracis tomento cinereo, alis cinereis, alulis nigricanti-cinereis, halteribus nigris.

Male. Purple, closely allied to *P. obtrusa.* Head, proboscis, palpi,

and antennæ black. Thorax with slight cinereous tomentum in front. Legs black. Wings cinereous; veins black; præbrachial vein forming a much-rounded and very obtuse angle at its flexure, almost straight thence to the tip; discal transverse vein hardly undulating, parted by full half its length from the border, and by a little less than its length from the flexure of the præbrachial vein; alulæ blackish cinereous; halteres black. Length of the body 4 lines; of the wings 7 lines.

Gen. Musca, *Linn.*

65. Musca sordidissima, n. s. *Mas.* Nigra, cinereo subtomentosa, alis nigricantibus, alulis sordide cinereis.

Male. Black; slightly covered with cinereous tomentum. Wings blackish; veins black; præbrachial vein forming a very obtuse angle at its flexure, very slightly curved inward thence to the tip; discal transverse vein nearly straight, parted by full half its length from the border, and by about its length from the flexure of the præbrachial vein; alulæ dingy cinereous. Length of the body 4 lines; of the wings 7 lines.

66. Musca aricioides, n. s. *Mas.* Rufescenti-fulva, capite antico cano, palpis nigris, antennis testaceis, thoracis disco piceo, abdomine cano-subtessellato fasciis duabus piceis, pedibus nigris, alis obscure cinereis.

Male. Reddish tawny. Head hoary in front. Eyes bare. Proboscis and palpi black. Antennæ testaceous; 3rd joint about four times the length of the 2nd. Thorax piceous on the disk. Rectus with a hoary band. Abdomen paler towards the tip, with two piceous bands, slightly tessellated with hoary reflexions. Legs black; femora at the base and coxæ reddish tawny. Wings dark cinereous; veins black, tawny towards the base; flexure of the præbrachial vein forming a curve which is very near the border; discal transverse vein slightly undulating, parted by more than half its length from the border, and by more than its length from the flexure of the præbrachial vein; alulæ whitish cinereous. Length of the body 4 lines; of the wings 7 lines.

This species seems to connect the Muscides with the Anthomyides.

Gen. Ochromyia, *Macq.*

67. Ochromyia promittens, *Walk.* See Vol. IV. p. 134.

Gen. Graptomyza, *Desv.*

68. Graptomyza calliphoroides, *Walk.* See Vol. V. p. 245.

Subfam. Anthomyides, *Walk.*

Gen. Aricia, *Macq.*

69. Aricia albicornis, n. s. *Mas et Fœm.* Ochraceo-fulva, capite

antico argenteo, frontalibus fœminæ atris, palpis nigris, antennis albis basi fulvis, thoracis disco abdominisque fasciis duabus nigris, tibiis tarsisque nigris, alis obscure cinereis.

Male and Female. Ochraceous tawny. Head silvery in front; frontalia of the female deep black. Proboscis and palpi black. Antennæ white, tawny at the base. Disk of the thorax black. Abdomen with two black bands on the hind borders of the second and third segments. Tibiæ and tarsi black. Wings dark cinereous; veins black, tawny at the base; præbrachial vein slightly curved towards the tip; discal transverse vein slightly undulating, parted by much more than half its length from the border, and by much more than its length from the præbrachial transverse vein. Length of the body $4\frac{1}{2}$ lines; of the wings 10 lines.

This species also inhabits New Guinea; and *Spilogaster xanthoceras* is mentioned erroneously as a native of that country, in Vol. V. p. 246.

70. Aricia significans, *Walk.* See Vol. III. p. 107.

71. Aricia contraria, *Walk.* See Vol. IV. p. 140.

72. Aricia leucoceros, n. s. *Fœm.* Fulva, capite antico albo, antennis albido-flavis basi fulvis, thoracis disco piceo vitta fulva, abdomine fasciis tribus piceis, 3_a interrupta, tibiis tarsisque piceis, alis cinereis costam versus fulvescentibus.

Male. Tawny, with black bristles. Head white in front. Proboscis and palpi black. Antennæ whitish yellow, tawny at the base. Disk of the thorax piceous, with a tawny stripe. Abdomen rather paler than the thorax, with three piceous bands; 1st band convex on the fore border; 2nd angular in the middle of the fore border; 3rd widely interrupted. Legs rather long; tibiæ and tarsi piceous. Wings cinereous, with a tawny tinge in front; veins black, tawny towards the base; cubital and præbrachial veins slightly approaching each other towards the border; discal transverse vein slightly undulating, parted by less than its length from the border, and by a little more than its length from the præbrachial transverse vein. Length of the body 5 lines; of the wings 10 lines.

73. Aricia biplaga, n. s. *Fœm.* Testacea, capite nigro albo tomentoso, antennis albido-flavis, thoracis disco nigricante fasciis tribus canis, abdomine nigro apicem versus cano-tessellato, alis fuscescenti-cinereis, alulis albidis.

Female. Testaceous, with black bristles. Head black, with white tomentum. Proboscis and palpi piceous. Antennæ whitish yellow. Disk of the thorax blackish, with three hoary stripes. Abdomen black, and lightly tessellated with hoary reflexions towards the tip. Tibiæ darker than the femora; tarsi piceous. Wings brownish cinereous; veins black, tawny towards the base; cubital vein very slightly curved towards the tip; discal transverse vein hardly undulating, parted by

more than half its length from the border, and by more than its length from the præbrachial transverse vein; alulæ whitish. Length of the body 4 lines; of the wings 8 lines.

74. Aricia prolixa, n. s. *Fœm.* Fulva, capite nigro, oculis albido cinctis, antennis albido-flavis, thorace vitta lata nigra, abdomine fasciis duabus guttisque duabus posticis nigris, tibiis tarsisque piceis, alis cinereis.

Female. Tawny, with black bristles. Head black, with whitish tomentum in front and along the eyes. Proboscis and palpi black. Antennæ whitish yellow. Thorax with a broad black stripe which extends to the base of the scutellum. Abdomen with two black bands, and with a black dot on each side near the tip. Tibiæ and tarsi piceous. Wings cinereous; veins black, tawny towards the base; cubital and præbrachial veins very slightly converging towards the tip; discal transverse vein slightly bent inward, parted by much more than half its length from the border, and by hardly more than its length from the præbrachial transverse vein; alulæ whitish cinereous. Length of the body $3\frac{1}{2}$ lines; of the wings 6 lines.

Gen. Cænosia, *Meigen.*

75. Cænosia liturata, n. s. *Fœm.* Glauco-cana, capite antico testaceo, oculis albido cinctis, antennis testaceis, abdomine vittis quatuor e maculis nigris, pedibus halteribusque testaceis, alis cinereis.

Female. Glaucous hoary, with black bristles. Head testaceous in front, whitish along the eyes. Palpi and antennæ testaceous, the latter extending to the epistoma; arista plumose. Abdomen with four rows of elongated black spots. Legs testaceous; tarsi piceous. Wings cinereous; veins black, testaceous towards the base; discal transverse vein straight, parted by its length from the border, and by almost twice its length from the præbrachial transverse vein; alulæ white; halteres testaceous. Length of the body 3 lines; of the wings 5 lines.

Subfam. Borborides, *Haliday.*

Gen. Cotamba, *Walk.*

76. Cotamba fumifera, *Walk.* See Vol. V. p. 247.

Subfam. Helomyzides, *Fallén.*

Gen. Helomyza, *Fallén.*

77. Helomyza atripennis, *Walk.* See Vol. III. p. 109.

78. Helomyza observans, *Walk.* See Vol. IV. p. 143.

79. Helomyza meritoria, n. s. *Fœm.* Testacea, thorace vittis duabus

pallidioribus, abdomine lanceolato vittis duabus fuscis, alis nigricantibus, maculis tribus marginalibus unaque costali punctoque discali limpidis, spatio basali limpido striga nigricante.

Female. Testaceous, with black bristles. Head paler in front and about the eyes. Antennæ about half the length of the face. Arista thinly and minutely pectinated. Thorax with two paler stripes. Abdomen lanceolate, longer and much narrower than the thorax, with a brown stripe along each side. Tarsi, except towards the base, and hind knees brownish. Wings blackish; basal part limpid, with the exception of a blackish streak; a limpid angular spot on the middle of the costa; three limpid, partly connected spots on the interior border; a limpid point in front of the discal transverse vein; veins black, testaceous at the base; discal transverse vein nearly straight, parted by less than half its length from the border, and by more than its length from the præbrachial transverse vein. Length of the body 6 lines; of the wings 10 lines.

80. Helomyza fissifera, n. s. *Fœm.* Testacea, arista plumosa, abdomine e guttis nigris bilineato, alis cinereis, venis nigricante nebulosis.

Female. Testaceous, with black bristles. Antennæ not reaching the epistoma; arista plumose. Abdomen with two rows of black dots. Legs paler than the body. Wings cinereous; veins black, testaceous towards the base; longitudinal veins, towards the tips, and transverse veins blackish-clouded; discal transverse vein straight, parted by half its length from the border, and by much more than its length from the præbrachial transverse vein. Length of the body $2\frac{1}{2}$ lines; of the wings 6 lines.

Allied to *H. restituta*.

Gen. Sciomyza, *Fallén*.

81. Sciomyza leucomelana, *Walk.* See Vol. IV. p. 144.

Subfam. Lauxanides, *Walk.*

Gen. Lonchæa, *Fallén*.

82. Lonchæa inops, *Walk.* See Vol. III. p. 110.

Subfam. Ortalides, *Haliday*.

Gen. Ortalis, *Fallén*.

83. Ortalis leucomera, n. s. *Fœm.* Obscure viridis, capite rufescente punctis duobus nigris, antennis testaceis, abdomine pedibusque nigris, tarsis albis, alis albis nigro quadrifasciatis, fascia 1ª abbreviata, 2ª furcata, 4ª interrupta, halteribus albis.

Female. Dark-green, shining, with black bristles. Head reddish, black towards the peristoma, and with a black point on each side of the

vertex. Antennæ testaceous, short; arista minutely plumulose. Abdomen and legs black; tarsi white. Wings white, with four blackish bands; 1st band abbreviated hindward; 2nd forked near the costa; 4th apical, obliquely divided in the middle; veins black; discal transverse vein straight, parted by less than its length from the border, and by much more than its length from the præbrachial transverse vein; halteres white. Length of the body 3 lines; of the wings 6 lines.

Gen. STRUMETA, *Walk.*

84. STRUMETA HELOMYZOIDES, n. s. *Mas et Fœm.* Testacea, thorace pectoreque nigro quadrivittatis, abdomine ovato (*mas*) aut lanceolato (*fœm.*) apicem versus nigricante, alis nigricantibus postice cinereis.

Male and Female. Testaceous, with long black bristles. Antennæ much less than half the length of the face; arista plumose. Thorax with four black stripes; inner stripes extending along the sides of the scutellum; outer stripes extending to the fore wings. Pectus with two black stripes on each side. Abdomen blackish towards the tip, oval in the male, lanceolate in the female. Wings blackish, hind part cinereous for more than half the breadth, and for two-thirds of the length from the base; veins black; discal transverse vein nearly straight, parted by half its length from the border, and by much more than its length from the præbrachial transverse vein. Length of the body 5–6 lines; of the wings 10–11 lines.

Gen. LAMPROGASTER, *Macq.*

85. Lamprogaster marginifera, *Walk.* See Vol. III. p. 111.

86. Lamprogaster scutellaris, *Walk.* See Vol. III. p. 112.

87. LAMPROGASTER SEPSOIDES, n. s. *Fœm.* Cyaneo-purpurea, capite antico rufescente, oculis albo cinctis, antennis rufescentibus, thorace vittis duabus anticis cinereis, scutello abdomineque purpureis, pedibus piceis, tarsis argenteis apice nigris, alis subcinereis nigro quadristrigatis, striga 1ª basali, 2ª 3ªque transversis, 4ª costali subapicali.

Female. Bluish purple, with black bristles. Head reddish, black above, white about the eyes. Antennæ reddish; arista bare. Thorax with an indistinct cinereous stripe on each side in front; scutellum and abdomen purple, the latter dull ferruginous beneath. Legs piceous; tarsi silvery, black towards the tips. Wings slightly cinereous, with an irregular black basal streak, with a black streak along the apical part of the costa, and with two intermediate transverse black streaks, of which the first is abbreviated hindward, and the second is interrupted between the cubital vein and the præbrachial vein and extends along the discal transverse vein; veins tawny, black towards the tips; halteres tawny, with black knobs. Length of the body 5 lines; of the wings 10 lines.

Gen. Dacus, *Fabr.*

88. Dacus pubiseta, *Walk.* See Vol. V. p. 294.

Var. Paler, probably immature; markings of the wings less distinct.

89. Dacus lituratus, *Walk.* See Vol. V. p. 251.

Gen. Polyara, *Walk.*

90. Polyara insolita, *Walk.* See Vol. III. p. 123.

Female. Abdomen lanceolate, about thrice the length of the thorax; two-thirds of the length forming a style, which is concave except towards the tip. Length of the body 8 lines.

Subfam. Sepsides, *Walk.*

Gen. Calobata, *Fabr.*

91. Calobata diffundens, *Walk.* See Vol. VI. p. 17.

92. Calobata contingens, n. s. *Mas.* Cinereo-nigra, capite argenteo, oculis albo cinctis, abdomine fasciis tribus subargenteo-cinereis, femoribus posterioribus flavescente bifasciatis, femoribus posticis basi flavescentibus, tarsis anticis albis, alis cinereis nigricante trifasciatis.

Male. Cinereous black. Head silvery, white about the eyes. Pectus with a slight silvery tinge. Abdomen with three cinereous bands, which have a slight silvery tinge. Legs black; posterior femora with two yellowish bands, one subapical, the other apical; hind femora yellowish at the base; fore tarsi white, except at the base. Wings cinereous, with three broad blackish bands, of which the 3rd is apical; veins black; cubital and præbrachial veins connected near the tips. Length of the body 6 lines; of the wings 10 lines.

Closely allied to *C. albitarsis.*

93. Calobata immiscens, n. s. *Mas.* Nigra, antennis rufis, thoracis disco subcinereo, ventre ferrugineo, pedibus fulvis, tarsis posterioribus, femoribus anticis, apice tibiisque anticis nigris, femoribus posterioribus subfasciatis, tarsis anticis albis basi nigris, alis cinereis fuscescente subobsolete bifasciatis.

Male. Black. Antennæ red. Disk of the thorax slightly cinereous. Abdomen ferruginous beneath. Legs tawny; posterior femora with almost obsolete darker bands; posterior tarsi, fore femora towards the tips, and fore tibiæ black; fore tarsi white, black at the base. Wings cinereous, with two very indistinct brownish bands, of which the 2nd is apical; veins black; cubital and præbrachial veins nearly united at the tips. Length of the body $6\frac{1}{2}$ lines; of the wings 10 lines.

Gen. Cardiacephala, *Macq.*

94. Cardiacephala debilis, *Walk.* See Vol. III. p. 124.

Subfam. Psilides, *Walk.*

Gen. Micropeza, *Macq.*

95. Micropeza fragilis, *Walk.* See Vol. I. p. 37.

Gen. Angitula, *Walk.*

96. Angitula longicollis, *Walk.* See Vol. III. p. 123. Elaphomyia polita, *Saund. Trans. Ent. Soc., New Series,* v. 416, pl. 12. f. 6, pl. 13. f. 1.

Gen. Elaphomyia, *Saunders.*

97. Elaphomyia cervicornis, *Saund. Trans. Ent. Soc. New Series,* v. 414, pl. 12. f. 4, 5.

Subfam. Hydromyzides, *Haliday.*

Gen. Notiphila, *Fallén.*

98. Notiphila ortalidoides, n. s. *Fœm.* Atra, obscura, capite antico argenteo, thorace postico et abdomine cinereo tomentosis, tarsis piceis basi albidis, alis nigris, fasciis duabus interruptis punctisque tribus discalibus albis, halteribus pallidis.

Female. Deep black, dull. Head silvery in front. Antennæ nearly reaching the epistoma; 3rd joint linear, rounded at the tip; arista plumose. Thorax hindward and abdomen with slight cinereous tomentum. Tarsi piceous, whitish towards the base. Wings black, with two white interrupted bands, and with three white points on the disk nearer the base; veins black; discal transverse vein straight, parted by less than its length from the border, and by more than its length from the præbrachial transverse vein; halteres pale. Length of the body $2\frac{1}{2}$ lines; of the wings 5 lines.

99. Notiphila unicolor, n. s. Ferruginea, antennis fulvis arista plumosa, abdomine piceo segmentis cinereo marginatis, pedibus fulvis, alis fuscescenti-cinereis, halteribus albidis.

Ferruginous. Antennæ tawny, very short; 3rd joint conical; arista plumose. Abdomen piceous; hind borders of the segments cinereous. Legs tawny. Wings brownish cinereous; veins black; discal transverse vein straight, parted by much more than its length from the border, and by much more than twice its length from the præbrachial transverse vein; halteres whitish. Length of the body $1\frac{3}{4}$ line; of the wings $3\frac{1}{2}$ lines.

Fam. HIPPOBOSCIDÆ, *Leach.*

Gen. Ornithomyia, *Leach.*

100. Ornithomyia Batchianica, *Walk.* See Vol. V. p. 300.

Waigiou.

Fam. MYCETOPHILIDÆ, *Haliday.*

Gen. Leia, *Meigen.*

1. Leia indivisa, n. s. *Fœm.* Ochracea, antennis nigris basi ochraceis, abdomine clavato depresso, tibiis tarsisque subsetulosis, alis cinereis plagis tribus obscurioribus, venulis duabus subcostalibus nigro nebulosis.

Female. Ochraceous. Antennæ black, except at the base. Ocelli nearly contiguous, in a line with the hind border of the eyes. Abdomen depressed, increasing in breadth from the base to the tip. Legs rather long and slender; tibiæ and tarsi minutely setulose, a little darker than the femora and coxæ. Wings cinereous, with two elongated darker cinereous spots along the hind border, the second also apical; costa with a darker cinereous apical streak; veins black, ochraceous at the base; two oblique subcostal veinlets clouded with black. Length of the body $3\frac{1}{2}$ lines; of the wings 6 lines.

This species, in the structure of the wing-veins, differs somewhat from all the European groups of the genus.

Fam. STRATIOMIDÆ, *Haliday.*

Gen. Nerua, *Walk.*

2. Nerua scenopinoides, *Walk.* See Vol. III. p. 81.

Fam. ASILIDÆ, *Leach.*

Subfam. Laphrites, *Walk.*

Gen. Laphria, *Fabr.*

3. Laphria complens, *Walk.* See Vol. IV. p. 106.

4. Laphria manifesta, *Walk.* See Vol. III. p. 87.

5. Laphria aperta, *Walk.* See Vol. III. p. 87.

6. Laphria puer, *Doleschall.* See Vol. V. p. 147.

7. Laphria auribasis, n. s. *Fœm.* Cupreo-nigra, capite pilis aureis vestito, mystace e setis nigris, antennarum articulo 3° lineari, abdomine basi subtusque aurato pilis apicalibus nigris, pedibus aurato pilosis, femoribus incrassatis, alis nigricantibus basi cinereis, halteribus flavo-albis.

Female. Cupreous black, stout. Head with brightly gilded hairs in front, thickly clothed beneath with less gilded hairs; mystax composed of several black bristles. Proboscis, palpi, and antennæ black; 3rd joint of the antennæ linear, elongate-conical towards the tip. Pectus with gilded tomentum. Abdomen brightly gilded beneath and at the base above; tip black, shining, with black hairs. Legs robust, thickly covered with long gilded hairs; femora much incrassated; tarsi with

black bristles. Wings blackish, cinereous towards the base; veins black; halteres yellowish white. Length of the body 10 lines; of the wings 18 lines.

Subfam. Asilites, *Walk.*

Gen. Asilus, *Linn.*

8. Asilus biligatus, n. s. *Mas.* Cervinus, capite antico albido, mystace e setis albis, antennis nigris, thorace vittis quatuor fuscis, abdomine fusco segmentis cinereo marginatis apice nigro, pedibus luteis, alis cinereis apice nigricantibus, halteribus flavescentibus.

Male. Fawn-colour, with a few black bristles. Head whitish in front; epistoma not prominent; mystax composed of several white bristles. Proboscis, palpi, and antennæ black; 3rd joint of the antennæ lanceolate; arista a little longer than the 3rd joint. Thorax with four brown stripes, the lateral pair interrupted. Pectus hoary. Abdomen brown; hind borders of the segments cinereous; tip black, shining. Legs luteous, robust, with a few black bristles; tarsi piceous towards the tips. Wings cinereous, blackish towards the tips; veins black; halteres yellowish. Length of the body 10 lines; of the wings 18 lines.

Gen. Ommatius, *Illiger.*

9. Ommatius lucifer, *Walk.* See Vol. III. p. 88.

10. Ommatius invehens, n. s. *Fœm.* Niger, sat robustus, facie albida, mystace e setis albis, thoracis suturis lateribus pectoreque canis, abdomine clavato segmentis cinereo marginatis apice fulvo, tarsis posticis basi tibiisque fulvis, alis nigricanti-cinereis, halteribus pallide flavis.

Female. Black, rather stout. Face whitish; mystax composed of white bristles. Third joint of the antennæ conical, very small. Shoulders, sutures and sides of the thorax, and pectus hoary. Abdomen clavate, rather flat, less than twice the length of the thorax; hind borders of the segments cinereous; tip tawny. Legs stout; tibiæ tawny; hind tarsi tawny towards the base. Wings blackish cinereous; veins black; halteres pale yellow. Length of the body 6 lines; of the wings 13 lines.

Fam. BOMBYLIDÆ, *Leach.*

Subfam. Therevites, *Walk.*

Gen. Thereva, *Latr.*

11. Thereva congrua, *Walk.* See Vol. III. p. 90.

Subfam. Bombylites, *Walk.*

Gen. Anthrax, *Fabr.*

12. Anthrax Pelops, *Walk.* See Vol. III. p. 90.

13. Anthrax semiseita, *Walk.* See Vol. I. p. 118.

14. Anthrax prætendens, *Walk.* See Vol. IV. p. 111.

Fam. SYRPHIDÆ, *Leach.*

Gen. Eristalis, *Latr.*

15. Eristalis splendens, *Leguillon.* See Vol. III. p. 95.

Gen. Syrphus, *Fabr.*

16. Syrphus ægrotus, *Fabr.* See Vol. I. p. 124.

Fam. CONOPIDÆ, *Leach.*

Gen. Conops, *Linn.*

17. Conops metaxantha, n. s. *Mas.* Nigra, capite sulcato, facie aurata, abdomine apicem versus aurato subtus fulvo, femoribus apice tibiisque rufescentibus, alis cinereis antice fuscescentibus, halteribus flavis apice fulvis.

Male. Black, with slight cinereous tomentum. Head broader than the thorax; vertex transversely furrowed; front longitudinally furrowed; face with bright pale-gilded tomentum. Antennæ longer than the breadth of the head, lanceolate towards the tips, which are stylate. Abdomen gilded towards the tip, which is tawny beneath. Femora, towards the tips, and tibiæ dull red. Wings cinereous, brownish in front; veins black; halteres pale yellow, with tawny knobs. Length of the body 7 lines; of the wings 14 lines.

Fam. MUSCIDÆ, *Latr.*

Subfam. Dexides, *Walk.*

Gen. Rutilia, *Desv.*

18. Rutilia moneta, *Gerstäcker.* See Vol. V. p. 241.

19. Rutilia lucigena, *Walk.* See Vol. V. p. 242.

Gen. Doleschalla, *Walk.*

20. Doleschalla consors, n. s. *Fœm.* Picea, capite argenteo, frontalibus atris, vittis duabus anticis antennisque nigris, thoracis vitta, lateribus pectoreque argenteis, abdomine subchalybeo faseiis tribus atris duabusque albidis, pedibus longis, alis angustis cinereis, costa et venarum marginibus nigris, alulis albido-cinereis.

Female. Piceous, slender, cylindrical. Head silvery white; frontalia deep black, broad, linear; a black stripe on each side of the epistoma. Antennæ black, nearly reaching the epistoma; 3rd joint linear, slen-

der, about six times the length of the 2nd. Thorax with a silvery stripe, which is attenuated in front; sides and pectus silvery. Abdomen with a chalybeous tinge, more than twice the length of the thorax; 2nd, 3rd, and 4th segments with broad deep-black bands on their hind borders; 3rd and 4th with whitish fore borders. Legs long. Wings narrow, cinereous, black along the costa and along the borders of the veins; præbrachial vein much curved at its flexure, straight thence to the tip; discal transverse vein curved inward, parted by less than half its length from the border, and by less than its length from the flexure of the præbrachial vein; alulæ whitish cinereous. Length of the body 7 lines; of the wings 12 lines.

21. Doleschalla gonypedoides, n. s. *Mas.* Obscure fusca, capite argenteo, frontalibus atris, antennis nigris basi fulvis, abdomine longissimo maculis octo lateralibus conicis chalybeo-testaceis, pedibus nigris longissimis, alis obscure cinereis, costa venisque nigricante nebulosis.

Male. Dark brown. Head silvery white; frontalia deep black, widening in front. Proboscis, palpi, and antennæ black; the latter not reach the epistoma, tawny at the base. Thorax cinereous along the sutures; sides and pectus whitish. Abdomen thrice the length of the thorax, with four large conical testaceous chalybeous-tinged spots on each side. Legs black, very long. Wings dark cinereous; costa and borders of the veins blackish-clouded; præbrachial vein very near the border, and emitting a short branch at its flexure, near which it is curved inward, straight thence to its tip; discal transverse vein undulating, parted by much less than half its length from the border, and by a little more than its length from the flexure of the præbrachial vein; alulæ pale cinereous. Length of the body 9 lines; of the wings 12 lines.

Gen. Prosena, *St. Farg.*

22. Prosena pectoralis, *Walk.* See Vol. III. p. 101.

Female? Blackish. Head silvery white; frontalia deep black, slightly widening in front. Antennæ tawny, not reaching the epistoma. Thorax with two whitish stripes; sides and pectus white. Abdomen oval, whitish, with long stout bristles; a deep-black band on the hind border of each segment. Legs black; coxæ and femora tawny, the latter with black tips. Wings cinereous, diffusedly and indistinctly brownish-bordered along the veins; præbrachial vein forming an obtuse angle at its flexure, very slightly curved inwards thence to the tip; discal transverse vein slightly undulating, parted by half its length from the border, and by less than its length from the flexure of the præbrachial vein.

There are two errors in the description referred to above. The specimen there characterized is a male, and is not a *Dexia*.

Subfam. Muscides, *Walk.*

Gen. Silbomyia, *Macq.*

23. Silbomyia costalis, *Walk.* See Vol. V. p. 159.

Gen. Musca, *Linn.*

24. Musca obscurata, *Walk.* See Vol. III. p. 105.

Subfam. Helomyzides, *Fallén.*

Gen. Dryomyza, *Fallén.*

25. Dryomyza semicyanea, *Walk.* See Vol. III. p. 109.

Gen. Xarnuta, *Walk.*

26. Xarnuta leucotelus, *Walk.* See Vol. I. p. 28.

Subfam. Ortalides, *Haliday.*

Gen. Adrama, *Walk.*

27. Adrama selecta, *Walk.* See Vol. III. p. 118.

Gen. Strumeta, *Walk.*

28. Strumeta concisa, n. s. *Fœm.* Fulva, subtus albido-flava, thoracis lateribus piceis, scutello albido-flavo, abdomine nigro antice albido-flavo, pedibus albido-flavis, alis nigro-fuscis, costa cinereo maculata, margine postico cinereo maculis fuscis.

Female. Tawny, whitish yellow beneath. Antennæ not reaching the epistoma; 3rd joint linear, rounded at the tip; arista minutely setulose. Thorax piceous along each side; scutellum whitish yellow. Abdomen oval, black, shining, broader, but hardly longer, than the thorax; basal half whitish yellow. Legs whitish yellow. Wings blackish, brown along the costa and towards the hind border, which is cinereous, with several brown spots; costa with a few cinereous spots; veins black; cubital vein deeply undulating, emitting a branch towards the costa near its tip, which is abruptly curved and joins the costa; discal transverse vein nearly straight, parted by less than half its length from the border, and by about its length from the præbrachial transverse vein; halteres pale. Length of the body $2\frac{3}{4}$ lines; of the wings 7 lines.

Gen. Poticara, *Walk.*

29. Poticara tricurvata, n. s. *Mas.* Nigra, capite antico flavo, antennis rufescentibus, arista plumosa, scutello metathorace pectoreque purpureis aut cyaneis, abdomine fusiformi purpurascenti-cyaneo, pedibus piceis, femoribus flavis, alis nigris, lituris costalibus et marginalibus limpidis.

Male. Black. Head bright yellow in front; epistoma very large. Antennæ reddish; 3rd joint short, slender, linear; arista plumose. Thorax with a slight cinereous bloom; scutellum, metathorax, and pectus dark purple or blue, shining. Abdomen fusiform, dark purplish blue, not longer, but very much narrower, than the thorax. Legs piceous; coxæ and femora yellow. Wings black, ample, with a limpid costal space, which is divided by two streaks; each of the latter has a lurid band; hind exterior space limpid, with two streaks, of which the first is dilated on each side of the discal transverse vein; hind border limpid towards the base; veins black, contorted; præbrachial transverse vein and discal transverse vein forming a continuous curved line. Length of the body 5 lines; of the wings 12 lines.

Gen. Platystoma, *Latr.*

30. Platystoma protensa, n. s. *Fœm.* Cinerea, capite antennisque lutescentibus, facie alba, thorace vittis sex fuscis, abdomine fasciis piceis, pedibus nigricantibus, alis cinereis fasciis nonnullis interruptis aut guttularibus tribusque integris nigricantibus, halteribus albidis.

Female. Cinereous. Head dull luteous; face white. Antennæ dull luteous, about half the length of the face; 3rd joint linear, rounded at the tip, full four times the length of the 2nd; arista setulose at the base. Thorax with six brown stripes. Abdomen oval, a little shorter and narrower than the thorax, with a piceous band on the hind border of each segment. Legs blackish. Wings cinereous, with several blackish bands, which are interrupted or composed of dots, with the exception of the three last; of these the 1st includes the discal transverse vein, and is incompletely forked in front; the 3rd is apical, and is connected with the 2nd on the costa; discal transverse vein straight, parted by one-fourth of its length from the border, and by very much more than its length from the præbrachial transverse vein; halteres whitish. Length of the body 7 lines; of the wings 14 lines.

Gen. Dacus, *Fabr.*

31. Dacus pectoralis, *Walk.* See Vol. III. p. 114.

32. Dacus lituratus, *Walk.* See Vol. V. p. 251.

33. Dacus sepedonoides, n. s. *Mas.* Fulvus, capite macula nigricante, oculis albido cinctis, thorace guttis duabus anticis nigris, abdomine compresso subclavato, alis cinereis apud venas fulvis apice nigricantibus.

Male. Tawny. Head whitish along the eyes; a large triangular blackish spot between the eyes. Antennæ extending beyond the epistoma; 3rd joint slightly widening towards the tip, full six times the length of the 2nd; arista bare. Thorax with a black dot on each side of the fore border. Abdomen compressed, subclavate, very much longer and narrower than the thorax. Wings cinereous, tawny along the costa

and along the veins, blackish towards the tips; veins tawny, black towards the tips; discal transverse vein curved outward, parted by hardly one-fourth of its length from the border, and by much more than its length from the oblique præbrachial transverse vein. Length of the body 8 lines; of the wings 14 lines.

34. Dacus curvifer, n. s. *Fœm.* Piceus, capite fulvo, facie nigro bipunctata, thorace vittis quatuor nigris, maculis duabus lateralibus scutelloque fulvis, abdomine nigro fascia ventreque fulvis, pedibus pallide fulvis, alis limpidis vittis duabus fasciisque tribus fuscescentibus.

Female. Piceous. Head tawny; face with a black point on each side. Antennæ extending beyond the epistoma; 3rd joint linear, slender, more than four times the length of the 2nd; arista bare. Thorax tomentose, with four slender black stripes, the outer pair abbreviated; a large spot at the base of each fore wing and the scutellum pale tawny. Abdomen black, oval, broader but not longer than the thorax; 2nd segment pale tawny; underside tawny. Legs pale tawny. Wings limpid, with two brownish stripes, and with three irregular brownish bands; 1st stripe costal; 2nd along the anal vein; 1st band connecting the two stripes; 2nd very broad, recurved inward towards the costa; 3rd oblique; discal transverse vein hardly undulating, parted by one-fourth of its length from the border, and by a little less than its length from the oblique præbrachial transverse vein. Length of the body 5 lines; of the wings 9 lines.

Gen. Trypeta, *Meigen.*

35. Trypeta multistriga, *Walk.* See Vol. III. p. 119.

Subfam. Achiides, *Walk.*

Gen. Achias, *Fabr.*

36. Achias latividěns, *Walk.* See Vol. III. p. 121.

Male? Piceous. Head whitish yellow in front; face with three black stripes; genæ much developed; petioles of the eyes longer than the space between them, with a yellow stripe in front. Thorax with five cinereous stripes; middle stripe double; pectus cinereous; scutellum purple. Abdomen purplish blue, with two large cinereous spots on each side, pale at the base.

37. Achias aspiciens, n. s. *Fœm.* Picea, capite fulvo fasciis duabus vittisque quatuor nigris, oculis subpetiolatis, thorace vittis quatuor rufescentibus, abdomine fulvo apice piceo, tarsis posticis femoribusque flavis, illis femoribusque anticis apice piceis, alis limpidis costa nigra, vena transversa discali fusco nebulosa.

Female. Piceous. Head tawny, with two black bands in front; face with two black stripes; an oblique black stripe on each side between the face and the genæ; eyes with short petioles, extending beyond

the sides of the thorax. Thorax with four reddish stripes. Abdomen dull tawny, fusiform, narrower and much longer than the thorax, piceous towards the tip. Femora yellow; fore femora with piceous tips; hind tarsi yellow, piceous towards the tips. Wings limpid, black along the costa, diffusedly clouded with brown about the discal transverse vein; veins black, pale towards the base; discal transverse vein straight, parted by less than one-fourth of its length from the border, and by much more than its length from the præbrachial transverse vein. Length of the body 6 lines; of the wings 12 lines.

Subfam. PSILIDES, *Walk.*

Gen. MICROPEZA, *Macq.*

38. Micropeza prolixa, *Wal.* See Vol. V. p. 299.

39. MICROPEZA PERCLUSA, n. s. *Mas.* Nigra, nitens, gracillima, epistomate albo, pectore fulvo, abdomine fulvo longo compresso apice nigro, pedibus piceis, coxis femoribusque posterioribus fulvis, his piceo fasciatis, tibiis tarsisque anticis albidis, alis nigricantibus basi fasciisque tribus cinereis.

Male. Black, shining, very slender. Epistoma white. Proboscis tawny. Antennæ extending much beyond the epistoma; 3rd joint linear, rather broad, rounded at the tip; arista minutely setulose. Pectus mostly tawny. Abdomen tawny, much compressed, very much longer than the thorax, increasing in depth towards the tip, which is black. Legs piceous, slender; coxæ tawny; posterior femora tawny, with a piceous band; fore tibiæ and fore tarsi whitish. Wings blackish, cinereous at the base, and with three cinereous bands; veins black; cubital and præbrachial veins converging exteriorly; discal transverse vein straight, parted by its length from the border, and by about thrice its length from the præbrachial transverse vein. Length of the body 6 lines; of the wings 7 lines.

Subfam. SEPSIDES, *Walk.*

Gen. ANGITULA, *Walk.*

40. Angitula longicollis, *Walk.* See Vol. III. p. 123.

NORTH CERAM.

Fam. MYCETOPHILIDÆ, *Haliday.*

Gen. SCIARA, *Meigen.*

1. SCIARA PONDEROSA, n. sp. (Sect. 1, *Meigen*). *Fœm.* Atra, valida, antennis robustis, thorace crasso, alis amplis nigricanti-cinereis apud costam nigricantibus.

Female. Deep black, robust. Antennæ stout, full half the length of

the body. Thorax thick. Abdomen a little longer than the thorax. Legs stout. Wings ample, blackish cinereous, blackish along the costa; veins black. Length of the body 2 lines; of the wings 6 lines.

Fam. CULICIDÆ, *Haliday.*

Gen. Megarhina, *Desv.*

2. Megarhina immisericors, *Walk.* See Vol. IV. p. 90.

Fam. TIPULIDÆ, *Haliday.*

Gen. Limnobia, *Meigen.*

Div. Body and legs very slender. Antennæ in the male minutely setulose, in the female plumose or beset with long bristles. Wings with two discal areolets; veins not forked; the usual transverse veinlet between the second and third externo-medial veins.

3. Limnobia delectata, n. s. *Mas et Fœm.* Nigra, pedibus piceis, alis cinereis. *Mas.* Thorace rufo, abdomine fasciis luteis, alarum maculis quatuor costalibus transversis fuscis. *Fœm.* Thorace piceo, abdomine fasciis albis, alarum maculis latis nigris.

Male and Female. Black. Legs piceous. Wings cinereous. Halteres tawny, with black knobs. *Male.* Thorax red. Abdomen with a luteous band on the fore border of each segment. Wings with four transverse brown spots along the costa; veinlet between the 2nd and the 3rd exterior medial veins clouded with brown. *Female.* Thorax piceous. Abdomen with a white band on the fore border of each segment. Wings with black spots, which are broader than those of the male. Length of the body 4–5 lines; of the wings $9\frac{1}{2}$–11 lines.

Div. Wings narrow, with a discal areolet; subcostal vein abruptly curved to the cubital vein at some distance from the tip of the wing; externo-medial veins long, not forked; veinlet between the third externo-medial vein and the subanal vein beyond the end of the discal areolet.

4. Limnobia innotabilis, n. s. *Fœm.* Ochracea, alis cinereis, venis nigris, vena subcostali flavescente.

Female. Ochraceous. Wings cinereous; veins black; subcostal vein yellowish. Length of the body 6 lines; of the wings 16 lines.

Gen. Tipula, *Linn.*

5. Tipula infindens, *Walk.* See Vol. IV. p. 92.

Fam. STRATIOMIDÆ, *Haliday.*

Gen. Nerua, *Walk.*

6. Nerua scenopinoides, *Walk.* Vol. III. p. 81.

Fam. TABANIDÆ, *Leach.*

Gen. Tabanus, *Linn.*

7. Tabanus obscuratus, n. s. *Fœm.* Piceus, capite antico ferruginco, antennarum articulo 3° rufo apice picco, thoracis lateribus nigro pilosis, pedibus nigris, alis fuscis areolis cinereo strigatis.

Female. Piceous. Head ferruginous in front; callus very slender. Third joint of the antennæ dark red, piceous towards the tip, with a very small horn. Thorax with black hairs on each side. Legs black. Wings dark brown, paler at the tips and along the hind border, with slight cinereous streaks in the disks of the areolets; veins black; fore branch of the cubital vein forming a rounded angle near its base, slightly curved thence to its tip. Length of the body 8 lines; of the wings 17 lines.

Closely allied to *T. doreicus.*

Var. Abdomen broader, shorter. Wings paler.

This may be a distinct species.

Fam. ASILIDÆ, *Leach.*

Subfam. Laphrites, *Walk.*

Gen. Laphria, *Fabr.*

8. Laphria Taphius, *Walk.* See Vol. IV. p. 105.

9. Laphria Vulcanus, *Wied.* See Vol. I. p. 10.

10. Laphria requisita, *Walk.* See Vol. IV. p. 105.

11. Laphria socia, *Walk.* See Vol. III. p. 84.

12. Laphria congrua, *Walk.* See Vol. V. p. 277.

Subfam. Asilites, *Walk.*

Gen. Asilus, *Linn.*

13. Asilus introducens, *Walk.* See Vol. IV. p. 108.

This specimen has a more distinct difference between the interior and exterior colours of the wings than that of the Celebes *A. introducens.*

Gen. Ommatius, *Illiger.*

14. Ommatius bacchoides, n. s. *Mas.* Niger, capite cano, mystace albo, abdomine clavato segmentorum suturis ferrugineis, pedibus crassis, alis nigricantibus costa nigra dilatata, halteribus fulvis.

Male. Black. Head hoary in front; face with black hairs; mystax and underside with white hairs. Pectus hoary. Abdomen clavate, cinereous beneath, about twice the length of the thorax; sutures of the segments ferruginous. Legs short, thick. Wings blackish, black along the costa, which is dilated; veins black; halteres tawny. Length of the body 6 lines; of the wings 10 lines.

15. Ommatius retrahens, *Walk.* See Vol. III. p. 88.

Gen. Leptogaster, *Meigen.*

16. Leptogaster tarsalis, *Walk.* See Vol. V. p. 281.

Fam. LEPTIDÆ, *Westw.*

Gen. Leptis, *Fabr.*

17. Leptis ferruginosa, *Wied.* See Vol. I. p. 118.

Fam. BOMBYLIDÆ, *Leach.*

Gen. Anthrax, *Fabr.*

18. Anthrax Pelops, *Walk.* See Vol. III. p. 90.

19. Anthrax semiscita, *Walk.* See Vol. I. p. 118.

Var. Transverse veinlets of the wings not clouded with black.

20. Anthrax emissa, n. s. *Fœm.* Nigra, capite pilis anticis albis, thoracis marginibus abdominisque lateribus basi luteo pilosis, abdomine plagis duabus apicalibus albido pilosis, alis cinereis triente basali costaque nigris.

Female. Black. Head with white hairs in front. Thorax along the fore border and on each side, and abdomen on each side at the base, with luteous hairs. Pectus with whitish hairs. Abdomen with a patch of whitish hairs on each side at the tip. Wings cinereous, black for one-third of the length from the base and along the costa, except at the tips; veins black; radial vein slightly curved near its tip; fore fork of the cubital vein much curved, forming a right angle near its base, which rejects a long branch; three externo-medial veins, subanal vein, and anal vein of the usual structure. Length of the body 5 lines; of the wings 14 lines.

Fam. EMPIDÆ, *Leach.*

Gen. Epiceia, *Walk.*

21. Epiceia ferruginea, *Walk.* See Vol. V. p. 149.

Fam. DOLICHOPIDÆ, *Leach.*

Gen. Psilopus, *Meigen.*

22. Psilopus seticornis, n. s. *Mas et Fœm.* Viridescenti-cyaneus, capite purpureo, facie argentea, antennis pedibusque nigris, arista longissima, thorace *fœm.* purpureo, abdomine aurato-viridi fasciis atris, tibiis flavescentibus, alis cinereis apud costam nigricantibus, halteribus nigris.

Male. Greenish blue. Head purple; face silvery white. Proboscis and antennæ black. Arista of the antennæ much longer than the thorax. Pectus slightly silvery. Abdomen golden green, with deep-black bands, which include the sutures between the segments. Legs black, long, slender; tibiæ yellowish. Wings cinereous, blackish along the costa; veins and halteres black; fore branch of the præbrachial vein slightly curved; discal transverse vein very undulating. Length of the body 3 lines; of the wings 6 lines.

Female. Thorax purple. Length of the body 2 lines; of the wings $4\frac{1}{2}$ lines.

23. Psilopus benedictus, *Walk.* See Vol. III. p. 91.

24. Psilopus egens, *Walk.* See Vol. III. p. 92.

Fam. SYRPHIDÆ, *Leach.*

Gen. Eristalis, *Latr.*

25. Eristalis splendens, *Leguillou.* See Vol. III. p. 95.

26. Eristalis merodontoides, n. s. *Mas et Fœm.* Nigra, facie lateribus cinereis, thoracis tomento fuscescente lateribus subfulvis, scutello sordide flavescente, abdomine fascia interrupta fulva fasciisque duabus canis, femoribus posticis incrassatis, alis cinereis apud costam subfuscis, alulis flavescenti-cinereis, abdomine elongato subcompresso.

Male and Female. Black. Face with cinereous tomentum on each side. Thorax with brownish tomentum; sides slightly tawny; scutellum pale dingy yellowish. Abdomen with an interrupted tawny band on the 2nd segment, and with two hoary bands on the fore borders of the 3rd and 4th segments. Hind femora incrassated; hind tibiæ curved. Wings cinereous, diffusedly brown along the costa; veins black, tawny towards the base; alulæ yellowish cinereous. *Male.* Abdomen slightly compressed towards the tip, much longer than that of the female; appendages very large. Length of the body 8–9 lines; of the wings 16 lines.

Gen. Syrphus, *Fabr.*

27. Syrphus ægrotus, *Fabr.* See Vol. I. p. 124.

Fam. MUSCIDÆ, *Latr.*

Subfam. Tachinides, *Walk.*

Gen. Masicera, *Macq.*

28. Masicera sarcophagata, n. s. *Mas.* Nigra, capite albo subaurato, frontalibus atris, facie obliqua argentea, thorace cano vittis quatuor nigris, abdomine tessellis subauratis et pilis nonnullis apicalibus ochraceis, alis cinereis, alulis albis.

Male. Black. Head white, slightly gilded, with cinereous hairs behind and beneath; frontalia deep black, slightly widening in front; face oblique, silvery; epistoma not prominent. Antennæ nearly reaching the epistoma; 3rd joint linear, rounded at the tip, full four times the length of the 2nd; arista slender. Thorax bristly, with hoary tomentum, which is interrupted by four black stripes. Abdomen elongate-oval, much longer than the thorax, tessellated with pale gilded tomentum, with a few ochraceous apical hairs. Legs stout, bristly. Wings cinereous; veins black; præbrachial vein forming a right angle at its flexure, near which it is slightly curved, and is thence straight to its tip; discal transverse vein curved inward, parted by less than its length from the border and from the flexure of the præbrachial vein; alulæ white. Length of the body 9 lines; of the wings 14 lines.

Gen. Rutilia, *Desv.*

29. Rutilia angustipennis, *Walk.* See Vol. III. p. 101.

Gen. Prosena, *St. Farg.*

30. Prosena secedens, n. s. *Fœm.* Cana, capite albido, frontalibus obscure rufis, antennis luteis, thorace vittis quatuor nigris, abdomine fasciis tribus latis atris, alis fuscescentibus apud costam obscurioribus, alulis albido-cinereis, halteribus fulvis.

Female. Hoary, stout. Head whitish, shining; frontalia dark red, widening in front. Proboscis tawny, black towards the tip. Antennæ luteous, not reaching the epistoma, which is prominent. Thorax with four slender black stripes. Abdomen oval, a little longer than the thorax, with three broad deep-black bands, of which the 1st is basal; some long spines towards the tip. Legs rather long. Wings brownish, darkest towards the costa; veins black; præbrachial vein emitting an extremely short branch at its flexure, which is acutely rectangular, very slightly curved thence to its tip; discal transverse vein slightly undulating, parted by nearly half its length from the border, and by much more than half its length from the flexure of the præbrachial vein; alulæ whitish cinereous; halteres tawny. Length of the body 5 lines; of the wings 9 lines.

31. Prosena coacta, n. s. *Fœm.* Nigra, cano tomentosa, capite albo, frontalibus ferrugineis, antennis fulvis, thorace vittis quatuor ni-

gris, scutelli apice fulvo, abdomine fulvo albido-micaceo segmentorum marginibus posticis nigro trimaculatis, coxis femoribusque fulvis, alis cinereis, venis fusco subnebulosis, halteribus flavis.

Female. Black, with hoary tomentum. Head white, with a slight fawn-coloured tinge on each side of the frontalia, which are ferruginous and linear. Proboscis black, tawny towards the base. Antennæ tawny, not near reaching the epistoma. Thorax with four indistinct black stripes. Scutellum tawny towards the tip. Abdomen oval, tawny, a little longer than the thorax, with whitish reflections; three rows of black spots on the hind borders of the segments. Legs long; coxæ and femora tawny. Wings cinereous; veins black, slightly clouded with brown; præbrachial vein forming a slightly rounded and obtuse angle at its flexure, straight thence till near its tip, where it is slightly bent; discal transverse vein undulating, parted by much more than half its length from the border, and by much less than its length from the flexure of the præbrachial vein; alulæ whitish cinereous; halteres pale yellow. Length of the body 5 lines; of the wings 10 lines.

Subfam. Sarcophagides, *Walk.*

Gen. Sarcophaga, *Meigen.*

32. Sarcophaga brevis, n. s. *Fœm.* Nigra, breviuscula, capite albido, frontalibus atris, palpis ferrugineis, thorace vittis quatuor canis, abdomine ovato maculis cinereis nitentibus quadrifariam tessellato, alis cinereis, alulis albis, halteribus fulvis.

Female. Black, rather short. Head whitish, shining; frontalia deep black, hardly widening in front. Palpi ferruginous. Thorax with four well-defined hoary stripes. Pectus hoary. Abdomen oval, not longer than the thorax, distinctly tessellated with four rows of shining cinereous spots; underside hoary. Wings cinereous; veins black, with the usual structure; alulæ white; halteres tawny. Length of the body 5 lines; of the wings 10 lines.

Subfam. Muscides, *Walk.*

Gen. Pyrellia, *Desv.*

33. Pyrellia obtrusa, *Walk.* See Vol. III. p. 105.

Gen. Ochromyia, *Macq.*

34. Ochromyia promittens, *Walk.* See Vol. IV. p. 134.

Gen. Musca, *Linn.*

35. Musca præcox, n. s. *Mas.* Nigra, sat angusta, capite argenteo thorace vittis tribus canis, abdomine cano lurido vittâ dorsali suturisque nigris, alis fuscescenti-cinereis.

Male. Black, rather narrow. Head silvery in front. Eyes bare. Antennæ rather short. Thorax with three hoary stripes. Pectus hoary. Abdomen oval, lurid, with hoary tomentum, not longer than the thorax; dorsal stripe and sutures of the segments black. Wings brownish cinereous; veins black; præbrachial vein forming a rounded obtuse angle at its flexure, slightly curved inward thence to its tip; discal transverse vein slightly curved, parted by more than half its length from the border, and by more than its length from the flexure of the præbrachial vein. Length of the body $2\frac{3}{4}$ lines; of the wings 5 lines.

Subfam. Lauxanides, *Walk.*

Gen. Lonchæa, *Fallén.*

36. Lonchæa inops, *Walk.* See Vol. III. p. 110.

Subfam. Ortalides, *Haliday.*

Gen. Platystoma, *Latr.*

37. Platystoma tarsalis, n. s. *Fœm.* Nigra, capite albo, frontalibus rufis antice nigris, peristomatis lateribus antennisque piceis, thorace vittis quatuor cinereis, scutello nitente, abdomine albido fasciis duabus nigris apice styliformi, tarsis basi albis, alis cinereis nigro quadrifasciatis, fascia 1ª antice flexa et dilatata, 2ª 3ªque antice flavescente strigatis, 4ª apud costam angulata, halteribus flavescentibus.

Female. Black, dull. Head white; frontalia red, black in front; peristoma piceous on each side. Proboscis and palpi black. Antennæ piceous, not reaching the epistoma. Thorax with four slight cinereous stripes; sides and pectus cinereous; scutellum shining. Abdomen whitish, abruptly styliform at the tip, not longer than the thorax, with two black bands, of which the 2nd is apical. Tarsi white towards the base. Wings cinereous, with four black bands; 1st band incomplete hindward, bent inward and dilated in front, where it is accompanied by some little transverse black streaks; 2nd and 3rd bands transversely streaked with yellowish in front; 4th band angular in front, and extending along the costa to the tip of the wing; veins black; discal transverse vein nearly straight, parted by one-fourth of its length from the border, and by much more than its length from the præbrachial transverse vein; halteres pale yellowish. Length of the body 6 lines; of the wings 12 lines.

Gen. Lamprogaster, *Macq.*

38. Lamprogaster marginifera, *Walk.* See Vol. III. p. 111.

Gen. Dacus, *Fabr.*

39. Dacus imitans, *Walk.* See Vol. IV. p. 150.

Gen. Trypeta, *Meigen.*

40. Trypeta melaleuca, n. s. *Mas.* Nigra, nitens, graeilis, capite antennisque testaceis, oculis albo cinctis, abdomine longe ovato, tibiis tarsisque testaceis, alis nigris basi strigisque quatuor posticis unaque costali albis.

Male. Black, shining, slender. Head testaceous, white about the eyes. Antennæ testaceous, not reaching the epistoma; arista bare. Abdomen elongate-oval, not longer than the thorax. Tibiæ and tarsi testaceous. Wings black, white at the base, and with five white transverse streaks, of which one forms a triangular costal spot, and three extend from the disk to the hind border; the 5th is very small, and is on the interior border opposite the costal spot; discal transverse vein straight, parted by less than half its length from the border, and by less than its length from the præbrachial transverse vein; halteres testaceous. Length of the body $1\frac{1}{2}$ line; of the wings $3\frac{1}{2}$ lines.

Subfam. Hydromyzides, *Haliday.*

Gen. Ochthera, *Latr.*

41. Oehthera innotata, *Walk.* See Vol. IV. p. 171.

Fam. HIPPOBOSCIDÆ, *Leach.*

Gen. Ornithomyia, *Olfers.*

42. Ornithomyia Batchianica, *Walk.* See Vol. V. p. 300.

Gorrite.

1. Rutilia ignobilis, n. s. *Fœm.* Obscure æneo-viridis, capite albido, frontalibus atris, antennis nigris basi rufescentibus, scutello virides-centi-fulvo, abdomine lato nigricanti-viridi, alis cinereis basi costæque dimidio interiore nigris.

Female. Dark æneous green. Head whitish; frontalia deep black, widening in front. Proboscis black. Palpi piceous. Antennæ black, not near reaching the epistoma, reddish at the base. Scutellum dark greenish tawny. Abdomen blackish green, much broader than the thorax. Legs black. Wings cinereous, mostly black at the base and along more than half the length of the costa; veins black; præbrachial transverse vein clouded with black; præbrachial vein forming a right angle at its flexure, curved inward thence to its tip; discal transverse vein undulating, parted by nearly half its length from the border, and by much less than its length from the flexure of the præbrachial vein. Length of the body $5\frac{1}{2}$ lines; of the wings 13 lines.

INDEX.

Page

Acanthopus 115
Achæa, *Hübn.* 181
—— atrivittata, *Walk.* 181
—— pulchrivena, *Walk.* . . . 182
—— purpureilinea, *Walk.* . . . 181
—— semipallida, *Walk.* 181
Achias, *Fabr.* 229
—— aspiciens, *Walk.* 229
—— latividens, *Walk.* 229
Achiides, *Walk.* 229
Acontia, *Ochs.* 49
—— caprina, *Walk.* 51
—— indecisa, *Walk.* 50
—— inordinata, *Walk.* 50
—— leucophæa, *Walk.* 49
—— marginalis, *Walk.* 49
—— roseo-nivea, *Walk.* 49
—— sordida, *Walk.* 50
—— xanthophila, *Walk.* . . . 50
Acontidæ, *Guén.* 49
Adams, A. On the species of Pyramidellinæ found in Japan . . 1
——. On the Japanese species of Leiostraca 84
——. On the species of Rostriferous Gasteropods (Strombidæ, Trichotropidæ, Cypræidæ, and Amphiperasidæ) found in Japan 91
——. On the species of Fusidæ which inhabit the seas of Japan . 105
——. On the species of Mitridæ found in the seas of Japan . . 198
Adraga, *Walk.* 204
—— univitta, *Walk.* 204
Adrama, *Walk.* 227
—— selecta, *Walk.* 227
Ælurus, *Klug* 27
—— comatus, *Sm.* 27
Agathis, *Latr.* 12
—— deceptor, *Sm.* 12
—— flavipennis, *Sm.* 12
Agenia, *Schiödte* 30
—— Amalthea, *Sm.* 30
—— blanda, *Guér.* 30
—— clavata, *Sm.* 31
—— Eudora, *Sm.* 30
—— Metella, *Sm.* 31

Page

Agenia Numeria, *Sm.* 31
—— Vesta, *Sm.* 31
Aglaë 115
Amblyopone, *Erichs.* 18
—— castaneus, *Sm.* 18
Ammophila, *Kirby* 34, 110
—— insolata, *Sm.* 34
Amphigonidæ, *Guén.* 184
Amphigonia, *Guén.* 184
—— costistriga, *Walk.* 184
Amphiperas, *Gron.* 95
—— brevis, *Sow.* 95
—— bulla, *Sow.* 95
—— punctata, *Duclos* 95
—— pyriformis, *Sow.* 95
—— Rhodia, *A. Ad.* 95
—— umbilicata, *Sow.* 95
Amphiperasidæ 95
Ampulex 111, 121
Andrena 113
Andrenidæ, *Leach* 44
Angitula, *Walk.* 222, 230
—— longicollis, *Walk.* . . 222, 230
Anomis, *Hübn.* 77
—— fulvida, *Guén.* 77
Anophia, *Guén.* 171
—— angulifera, *Walk.* 171
—— limitaris, *Walk.* 171
—— suffundens, *Walk.* 172
Anthidium 113
Anthomyides, *Walk.* 216
Anthophila, Distribution of the . 124
Anthophilidæ, *Dup.* 58
Anthophora, *Latr.* 48, 116
—— elegans, *Sm.* 48
—— zonata, *Linn.* 48
Anthrax, *Fabr.* 209, 233
—— emissa, *Walk.* 233
—— Pelops, *Walk.* . . 209, 224, 233
—— prætendens, *Walk.* 225
—— semiscita, *Walk.* . . . 1, 233
Apis, *Linn.* 48, 117
—— dorsata, *Fabr.* 48
—— socialis, *Latr.* 48
Aricia, *Gray* 93
—— Arabica, *Linn.* 93
—— caput-serpentis, *Linn.* . . . 94

Page

Aricia moneta, *Linn.* 94
—— reticulata, *Martyn* 93
Aricia, *Macq.* 216
—— albicornis, *Walk.* 216
—— biplaga, *Walk.* 217
—— contraria, *Walk.* 217
—— leucocerus, *Walk.* 217
—— prolixa, *Walk.* 218
—— significans, *Walk.* 217
Ariolica, *Walk.* 53
—— lineolata 53
—— signata 54
Arippara, *Walk.* 74
—— indicator, *Walk.* 74
Arpactophilus, *Sm.* 36
—— bicolor, *Sm.* 36
Artigisa, *Walk.* 160
—— nigrosignata, *Walk.* . . . 160
Asilidæ, *Leach* 206, 223, 232
Asilites, *Walk.* 207, 224, 232
Asilus, *Linn.* 207, 224, 232
—— biligatus, *Walk.* 224
—— depulsus, *Walk.* 207
—— didymoides, *Walk.* 208
—— introducens, *Walk.* . . . 232
Asinduma, *Walk.* 167
—— exscripta, *Walk.* 167
Asta, *Walk.* 170
—— quadrilinea, *Walk.* 170
Astygisa, *Walk.* 192
—— larentiata, *Walk.* 192
—— metaspila, *Walk.* 193
Attidæ, *Sm.* 21
Augochlora 113
Aulana, *Walk.* 204
—— confirmata, *Walk.* 204
Ausinza, *Walk.* 192
—— æqua, *Walk.* 192
Autoba, *Walk.* 57
—— versicolor, *Walk.* 58
Automala, *Walk.* 60
—— semidolosa, *Walk.* 60
Axona, *Walk.* 211
—— vollucelloides, *Walk.* . . . 212
Baccha, *Fabr.* 212
—— purpuricola, *Walk.* . . . 212
—— tripartita, *Walk.* 212
Badausa, *Walk.* 170
—— hypenoides, *Walk.* 170
Badiza, *Walk.* 195
—— ereboides, *Walk.* 196
Bagistana, *Walk.* 194
—— rudis, *Walk.* 194
Banisia, *Walk.* 77
—— fenestrifera, *Walk.* 78
—— tetragonata, *Walk.* 78
Bantana, *Walk.* 52
—— albida, *Walk.* 52
Bees, social, distribution of . . . 116
Bembex 111

Page

Bendidæ 178
Beria, *Walk.* 61
—— recusata, *Walk.* 62
Bibionidæ, *Haliday* 202
Blackwall, John. A succinct Review of recent attempts to explain several remarkable facts in the physiology of Spiders and Insects 154
Bombus 111
Bombylidæ, *Leach* . . 209, 224, 233
Bombylites, *Walk.* . . . 209, 224
Borborides, *Haliday* 218
Bracon, *Fab.* 11
—— occultator, *Sm.* 11
—— penetrator, *Sm.* 11
Braconidæ, *Westw.* 11
Briarda, *Walk.* 161
—— decens, *Walk.* 161
Cænosia, *Meig.* 218
—— liturata, *Walk.* 218
Callithea, *Swains.* 201
—— crebrilirata, *Rve.* 201
—— obeliscus, *Rve.* 201
—— spreta, *A. Ad.* 201
Callopistria, *Hübn.* 64
—— ventralis, *Walk.* 64
Calobata, *Fabr.* 221
—— contingens, *Walk.* 221
—— diffundens, *Walk.* 221
Calpidæ, *Guén.* 74
Calpurnus, *Montf.* 95
—— bullulatus, *Sow.* 95
—— carneus, *Lam.* 95
—— concinnus, *Sow.* 95
—— dentatus, *Sow.* 95
—— dorsuosus, *Hinds* 96
—— formosus, *Sow.* 96
—— lacteus, *Lam.* 95
—— striatulus, *Sow.* 95
Canæa, *Walk.* 73
—— semitessellata, *Walk.* . . . 73
Canarium, *Schum.* 92
—— Luhuanum, *Linn.* 92
Cancilla, *Swains.* 199
—— carnicolor, *Rve.* 199
—— circulata, *Kien.* 199
—— Herklotsiana, *Dohrn* . . . 199
—— rosacea, *Rve.* 199
—— straminea, *A. Ad.* 199
Canthiridus, *Montf.* 108
—— Cumingianus, *Dkr.* . . . 108
—— erythrostomus, *Rve.* . . . 108
Capnodes, *Guén.* 188
—— anomioides, *Walk.* . . . 188
—— intractata, *Walk.* 188
—— maculicosta, *Walk.* 188
Cardiacephala, *Macq.* 221
—— debilis, *Walk.* 221
Carissa, *Walk.* 168

Page

Carissa cossoides, *Walk.* . . . 168
Carmara, *Walk.* 62
—— subcervina, *Walk.* 63
Carteia, *Walk.* 82
—— nebulilinea, *Walk.* 83
Cataulacus, *Sm.* 24, 120
—— setosus, *Sm.* 24
Catephiidæ, *Guén.* 171
Cenocœlius, *Haliday* 12
—— insidiator, *Sm.* 12
Cerbia, *Walk.* 179
—— subolivacea, *Walk.* 179
Cerceris, *Latr.* 37, 112, 122
—— immolator, *Sm.* 37
Chlorion 111
Chodda, *Walk.* 64
—— sordidula, *Walk.* 64
Cholimma, *Walk.* 60
—— leucanioides, *Walk.* . . . 61
Choluata, *Walk.* 57
—— eburneifera, *Walk.* 57
Chorsia, *Walk.* 59
—— maculosa, *Walk.* 60
Chrysallida, *Cpr.* 2
—— alveata, *A. Ad.* 2
—— consimilis, *A. Ad.* 2
—— consobrina, *A. Ad.* 2
—— crucella, *A. Ad.* 3
—— filocincta, *A. Ad.* 2
—— galbula, *A. Ad.* 3
—— mumia, *A. Ad.* 2
—— munda, *A. Ad.* 2
—— mundula, *A. Ad.* 2
—— nana, *A. Ad.* 2
—— plicata, *A. Ad.* 2
—— pupula, *A. Ad.* 2
—— rufolineata, *A. Ad.* 3
Chrysomyia, *Desv.* 215
—— divitiosa, *Walk.* 215
Chrysopila, *Macq.* 208
—— stylata, *Walk.* 208
Chuduca, *Walk.* 164
—— pyraloides, *Walk.* 165
Ciasa, *Walk.* 165
—— pustulifera, *Walk.* 165
Cœlioxys, *Latr.* 47, 114
—— intrudens, *Sm.* 47
Cominella, *Gray* 107
—— fucata, *A. Ad.* 107
Conopidæ, *Leach* 225
Conops, *Linn.* 225
—— metaxantha, *Walk.* 225
Corticata, *Walk.* 52
—— scoparioides, *Walk.* . . . 53
Corsa, *Walk.* 166
—— absorbens, *Walk.* 166
Cosmophila, *Boisd.* 76
—— fusciffons, *Walk.* 77
—— inconclusa, *Walk.* 77
—— scitipennis, *Walk.* 76

Page

Costellaria, *Swains.* 200
—— bellula, *A. Ad.* 200
—— cithara, *Rve.* 200
—— Collinsoni, *A. Ad.* 200
—— cruentata, *Chemn.* 200
—— Dohrni, *A. Ad.* 200
—— militaris, *Rve.* 200
—— pusilla, *A. Ad.* 200
—— semicostata, *Anton* 200
—— Suluensis, *Ad. & Rve.* . . . 200
—— zelotypa, *Rve.* 200
Cotamba, *Walk.* 218
—— fumifera, *Walk.* 218
Crabro 112, 122
Crabronidæ, *Leach* 35
——, Distribution of the . 112, 122
Crithote, *Walk.* 182
—— horridipes, *Walk.* 183
Crocisa, *Jur.* 47, 115
—— nitidula, *Fabr.* 47
Cropia, *Walk.* 166
—— onerata, *Walk.* 166
Cryptoceridæ, *Sm.* 23
——, Distribution of the . . . 120
Crytocerus 120
Cryptus, *Fabr.* 7
—— albopictus, *Sm.* 7
—— tarsatus, *Sm.* 7
—— volatilis, *Sm.* 7
Cteniosehelus 115
Culex, *Linn.* 202
—— obturbans, *Walk.* 202
Culicidæ, *Haliday* 202, 231
Culicula, *Walk.* 178
—— bimarginata, *Walk.* . . . 178
Curgia, *Walk.* 166
—— nonagrica, *Walk.* 166
Cylindra, *Schum.* 199
—— undulosa, *Rve.* 199
Cyphoma, *Bolt.* 96
—— elongatum, *A. Ad.* 96
Cypræa, *Linn.* 93
—— felina, *Gray* 93
—— fimbriata, *Gmel.* 93
—— flaveola, *Gmel.* 93
Cypræidæ 93
Dacus, *Fabr.* 221, 228, 237
—— curvifer, *Walk.* 228
—— imitans, *Walk.* 237
—— lituratus, *Walk.* 228
—— pectoralis, *Walk.* 228
—— pubiseta, *Walk.* 221
—— sepedonoides, *Walk.* . . . 228
Daona, *Walk.* 190
—— mansueta, *Walk.* 190
Dapha, *Walk.* 54
—— exhibens, *Walk.* 55
Dacygastræ, *Leach* 46
Detounda, *Walk.* 193
—— spurcata, *Walk.* 194

Page

Deva, *Walk.* 74
—— infundens, *Walk.* 74
Dexia, *Meig.* 214
—— alulifera, *Walk.* 214
Dexides, *Walk.* 214, 225
Diaphorus, *Meig.* 210
—— resumens, *Walk.* 210
Dimirica, *Walk.* 56
—— nubifera, *Walk.* 56
Doleschalla, *Walk.* 225
—— consors, *Walk.* 225
—— gonypedoides, *Walk.* 226
Dolichopidæ, *Leach* . . . 209, 234
Dolichopus, *Latr.* 210
—— pulchriceps, *Walk.* 210
Dorsippa, *Walk.* 81
—— notabilis, *Walk.* 82
Dorylus 119
Dryomyza, *Fallén* 227
—— semicyanea, *Walk.* 227
Dumatha, *Walk.* 195
—— herbida, *Walk.* 195
Dyrzela, *Walk.* 51
—— incrassata 51
—— parallela 51
Echinopla, *Sm.* 23, 120
—— deceptor, *Sm.* 23
—— nitida, *Sm.* 23
—— striata, *Sm.* 23
Ectatomma, *Sm.* 19
—— rugosa, *Sm.* 19
Elaphomyia, *Saunders* 222
—— cervicornis, *Saunders* . . . 222
Empidæ, *Leach* 209, 233
Enea, *Walk.* 63
—— signicosta 63
Entozoa of Salmo salar 149
Epiceia, *Walk.* 209, 233
—— ferruginea, *Walk.* . . 209, 233
Erastridæ, *Guén.* 58
Erastria, *Ochs.* 58
—— securifera, *Walk.* 58
Eriopidæ, *Guén.* 64
Eristalis, *Latr.* 210, 225, 234
—— æquipars, *Walk.* 210
—— bomboides, *Walk.* 210
—— erythropyga, *Walk.* 211
—— inscripta, *Walk.* 210
—— lucilioides, *Walk.* 210
—— merodontoides 234
—— placens, *Walk.* 211
—— postscripta, *Walk.* 210
—— splendens, *Leguillou* . 225, 234
Eucera 115
Eumenes, *Latr.* 37, 122
—— agilis, *Sm.* 37
—— arcuatus, *Fabr.* 37
—— conformis, *Sm.* 38
—— diligens, *Sm.* 39
—— medianus, *Sm.* 38

Page

Eumenes perplexus, *Sm.* 39
—— Praslina, *Guér.* 37
—— pullatus, *Sm.* 39
—— tricolor, *Sm.* 37
—— volatilis, *Sm.* 38
—— Urvillei, *Sauss.* 37
Eumenidæ 37, 122
Eurhipidæ, *Guén.* 65
Euritis 115
Eurygaster, *Macq.* 213
—— interdicta, *Walk.* 213
Eutelia, *Hübn.* 65
—— approximata, *Walk.* 65
—— consentanea, *Walk.* 68
—— dimidiata, *Walk.* 66
—— dulcilinea 66
—— instructa 68
—— obliquata 66
—— opposita 67
—— subocellata 68
Euthria, *Gray* 108
—— badia, *A. Ad.* 108
—— lirata, *A. Ad.* 108
—— plumbea, *Phil.* 108
Evanidæ, *Leach* 6
Felia, *Walk.* 197
—— intermixta, *Walk.* 197
Flammona, *Walk.* 55
—— quadrifasciata, *Walk.* 55
Formica, *Linn.* 12, 118
—— circumspecta, *Sm.* 12
—— coxalis, *Sm.* 12
—— fragilis, *Sm.* 12
—— lævissima, *Sm.* 13
—— longiceps, *Sm.* 13
—— nitida, *Sm.* 13
—— pallida, *Sm.* 12
—— pavida, *Sm.* 13
—— quadriceps, *Sm.* 12
Formicidæ, *Leach* 12
——, Distribution of the 118
Fusidæ which inhabit the seas of Japan, A. Adams on the species of 105
Fusus, *Klein* 105
—— Beckii, *Rve.* 106
—— crebriliratus, *Rve.* 105
—— fragosus, *Rve.* 106
—— gracillimus, *Ad. & Rve.* . . 106
—— Novæ-Hollandiæ, *Rve.* . . 105
—— pagoda, *Less.* 106
—— perplexus, *A. Ad.* 106
—— solidulus, *A. Ad.* 106
Gadirtha, *Walk.* 161
—— chalybea, *Walk.* 161
—— diffundens, *Walk.* 161
—— discigera, *Walk.* 163
—— ferromixta, *Walk.* 162
—— inexacta, *Walk.* 161
—— metaphæa, *Walk.* 163
—— polygrapha, *Walk.* 162

Page

Gadirtha quadrinotata, *Walk.* . . 162
—— semifervens, *Walk.* 163
Gallinula, *Klein.* 92
—— succincta, *Linn.* 92
—— vittata, *Lam.* 92
Garella, *Walk.* 51
—— rotundipennis, *Walk.* . . . 52
Gariga, *Walk.* 59
—— argentilinea, *Walk.* . . . 59
Gayella 122
Ginæa, *Walk.* 190
—— pectoralis, *Walk.* 190
Glypta, *Grav.* 10
—— fracticornis, *Sm.* 10
Gonepteridæ, *Guén.* 76
Graummodes, *Guén.* 182
—— Mygdon, *Cram.* 182
Graptomyza, *Desv.* 216
—— calliphoroides, *Walk.* . . . 216
Gymnoplistia, *Westw.* 203
—— melancholica, *Walk.* . . . 203

Halictus 113
Helomyza, *Fallén* 218
—— atripennis, *Walk.* 218
—— fissifera, *Walk.* 219
—— meritoria, *Walk.* 218
—— observans, *Walk.* 218
Helomyzides, *Fallén* 218
Hemifusus, *Swains.* 105
—— tuba, *Gmel.* (sp.) 105
Heptacondylus 120
Hippoboscidæ, *Leach* . . . 222, 238
Homoptera, *Boisd.* 83
—— biarmioides, *Walk.* 83
—— intractabilis, *Walk.* . . . 83
Homopteridæ, *Boisd.* 83
Hulodes, *Guén.* 178
—— saturnioides, *Guén.* . . . 178
Hyblæidæ, *Guén.* 75
Hyblæa, *Fabr.* 75
—— erycinoides, *Walk.* 75
—— tortricoides, *Guén.* 75
Hydromyzides, *Haliday* . . 222, 238
Hymenoptera, Aculeate, of the Eastern Archipelago, Table showing the geographical distribution of the 125
Hypogrammidæ, *Guén.* 161
Hypopyra, *Guén.* 178
—— apicalis, *Walk.* 178
—— vespertilio, *Fabr.* 178

Icaria, *Sauss.* 41
—— deceptor, *Sm.* 42
—— impetuosa, *Sm.* 41
—— irritata, *Sm.* 42
—— maculiventris, *Sauss.* . . . 41
—— morosa, *Sm.* 42
—— torrida, *Sm.* 42
Ichneumonidæ, *Leach* 7
Ichnogaster, *Sauss.* 41, 123

Page

Ichnogaster iridipennis, *Sm.* . . 41
—— unicolor, *Sm.* 41
Idicara, *Walk.* 172
—— olivacea, *Walk.* 172
Iphinoë, *H. & A. Ad.* 93
—— quadricarinata, *A. Ad.* . . . 93
—— unicarinata, *Sow.* 93
Lacibisa, *Walk.* 82
—— bifaria, *Walk.* 82
Lagoptera, *Guén.* 179
—— pallescens, *Walk.* 179
Lamprogaster, *Macq.* . . . 220, 237
—— marginifera, *Walk.* . . 220, 237
—— sepsoides, *Walk.* 220
—— scutellaris, *Walk.* 220
Laphria, *Fabr.* 206, 223, 232
—— aperta, *Walk.* 223
—— auribasis, *Walk.* 223
—— complens, *Walk.* 223
—— congrua, *Walk.* . . . 206, 232
—— consors, *Walk.* 206
—— divulsa, *Walk.* 206
—— flagrantissima, *Walk.* . . . 206
—— germana, *Walk.* 206
—— manifesta, *Walk.* 223
—— puer, *Walk.* 206, 223
—— requisita, *Walk.* 232
—— socia, *Walk.* 232
—— Taphius, *Walk.* 232
—— Vulcanus, *Walk.* 232
Laphrites, *Walk.* . . . 206, 223, 232
Larra 111
Larrada, *Sm.* 34, 121
—— aurulenta, *Sm.* 34
—— funerea, *Sm.* 34
—— modesta, *Sm.* 34
—— sabulosa, *Sm.* 35
Larridæ, *Leach* 34
—— distribution of 111
Lauxanides, *Walk.* . . . 219, 237
Leia, *Meigen* 223
—— indivisa, *Walk.* 223
Leiostraca, A. Adams on the Japanese species of 84
—— Ariel, *A. Ad.* 85
—— balteata, *A. Ad.* 89
—— bilineata, *Ad. & Rve.* . . . 87
—— bifascialis, *A. Ad.* 88
—— bizona, *A. Ad.* 88
—— cinctella, *A. Ad.* 89
—— cingenda, *A. Ad.* 89
—— circumcincta, *A. Ad.* . . . 88
—— clara, *A. Ad.* 84
—— clavella, *A. Ad.* 84
—— conspurcata, *A. Ad.* 87
—— crassula, *A. Ad.* 90
—— crystallina, *A. Ad.* 86
—— exigua, *A. Ad.* 87
—— gracilenta, *A. Ad.* 89
—— hastata, *A. Ad.* 85

Page

Lciostraca humilis, *A. Ad.* 90
—— inquinata, *A. Ad.* 90
—— interrupta, *A. Ad.* 89
—— labiata, *A. Ad.* 84
—— lanceata, *A. Ad.* 84
—— Leachii, *A. Ad.* 84
—— lentiginosa, *A. Ad.* 87
—— lepida, *A. Ad.* 85
—— metulina, *A. Ad.* 86
—— Mindorensis, *A. Ad.* 85
—— Miranda, *A. Ad.* 85
—— nana, *A. Ad.* 87
—— nitida, *A. Ad.* 84
—— nivea, *A. Ad.* 85
—— nixa, *A. Ad.* 87
—— Oberon, *A. Ad.* 85
—— paxillus, *A. Ad.* 84
—— picturata, *A. Ad.* 87
—— pistillum, *A. Ad.* 86
—— pumila, *A. Ad.* 87
—— pura, *A. Ad.* 85
—— pusilla, *A. Ad.* 86
—— pusio, *A. Ad.* 86
—— pygmæa, *A. Ad.* 86
—— scitula, *A. Ad.* 90
—— spiculum, *A. Ad.* 87
—— spreta, *A. Ad.* 90
—— subulina, *A. Ad.* 85
—— tæniata, *A. Ad.* 88
—— tantilla, *A. Ad.* 89
—— turgidula, *A. Ad.* 84
—— vincta, *A. Ad.* 88
Leptidæ, *Westw.* 208, 233
Leptis, *Fabr.* 208, 233
—— ferruginosa, *Wied* . . 208, 233
Leptogaster, *Meigen* . . . 208, 233
—— longipes, *Walk.* 208
—— tarsalis, *Walk.* 233
Limnobia, *Meig.* 202, 231
—— auroratra, *Walk.* 202
—— deleotata, *Walk.* 231
—— innotabilis, *Walk.* 232
—— selectissima, *Walk.* 202
Liogastra 115
Lithosiidæ, *Steph.* 196
Lonchæa, *Fallén* 219, 237
—— inops, *Walk.* . . . 219, 237
Luponia, *Gray* 94
—— caurica, *Linn.* 94
—— clandestina, *Linn.* 94
—— erosa, *Linn.* 94
—— helvola, *Linn.* 94
—— onyx, *Linn.* 94
—— pallida, *Gray* 94
—— vitellus, *Linn.* 94
Macedа, *Walk.* 176
—— discalis, *Walk.* 176
—— mansueta, *Walk.* 176
Macromeris, *St. Farg.* 33
—— violacea, *St. Farg.* 33

Page

Manoba, *Walk.* 62
—— implens, *Walk.* 62
Masicera, *Macq.* 213, 235
—— mysolana, *Walk.* 213
—— sarcophagata, *Walk.* . . . 235
Maxilua, *Walk.* 168
—— frontalis, *Walk.* 169
Megachile, *Latr.* 46
—— Alecto, *Sm.* 46
—— fulvifrons, *Sm.* 46
—— funeraria, *Sm.* 46
—— Lachesis, *Sm.* 46
—— placida, *Sm.* 46
Megarhina, *Desv.* 202, 231
—— immisericors, *Walk.* . 202, 231
Megischus, *Brullé* 6
—— insidiator, *Sm.* 7
—— spoliator, *Sm.* 6
—— tarsalis, *Sm.* 6
Melecta 115
Melipona 117
Melissa 115
Melissodes 116
Meranoplus 120
Mesocheira 115
Mesostenus, *Brullé* 8
—— multipictus, *Sm.* 8
—— pulcherrimus, *Sm.* 8
Micra, *Guén.* 58
—— derogata, *Walk.* 58
Micropeza, *Macq.* 222, 230
—— fragilis, *Walk.* 222
—— perclusa, *Walk.* 230
—— prolixa, *Walk.* 230
Minica, *Walk.* 175
—— nigrilinea, *Walk.* 176
M'Intosh, W. C. Notes on the Food and Parasites of the Salmo Salar of the Tay 145
Miralda, *A. Ad.* 3
—— diadema, *A. Ad.* 3
—— gemma, *A. Ad.* 3
—— Mariella, *A. Ad.* 3
Mirobriga, *Walk.* 196
—— pulchripicta, *Walk.* . . . 196
Mitra, *Lam.* 198
—— floccata, *Rve.* 198
—— impressa, *Anton* 198
—— Japonica, *A. Ad.* 198
—— sacerdotalis, *A. Ad.* . . . 198
Mitreola, *Swains.* 199
——ignobilis, *Rve.* 199
Mitridæ found in the Seas of Japan, A. Adams on the species of . . 198
Mitrinæ 198
Monedula 111
Mormula, *A. Ad.* 1
—— egregia, *A. Ad.* 2
—— Rissoina, *A. Ad.* 1
Mucronalia, *A. Ad.* 91

Page

Mucronalia bicincta, *A. Ad.* . . 91
—— exilis, *A. Ad.* 91
—— lactea, *A. Ad.* 91
—— subula, *A. Ad.* 91
Mumiola, *A. Ad.* 5
—— reticosa, *A. Ad.* 5
—— spirata, *A. Ad.* 5
—— tessellata, *A. Ad.* 6
Murgisa, *Walk.* 193
—— orgyoides, *Walk.* 193
Murray, Andrew. On the Early stages of Development of Orthopterous Insects 97
Musama, *Walk.* 205
Musca, *Linn.* 216, 227
—— aricioides, *Walk.* 216
—— obscurata, *Walk.* 227
—— præcox, *Walk.* 236
—— sordidissima, *Walk.* 216
Muscidæ, *Latr.* . . . 213, 225, 235
Muscides, *Walk.* . . . 215, 227, 236
Mutilla, *Linn.* 24, 120
—— anthylla, *Sm.* 24
—— Damia, *Sm.* 24
—— fausta, *Sm.* 25
—— Ianthea, *Sm.* 24
—— mirabilis, *Sm.* 24
—— nigra, *Sm.* 24
—— suspiciosa, *Sm.* 24
—— Thera, *Sm.* 24
Mutillidæ, *Leach* 24
——, Distribution of . . . 110, 120
Mycetophilidæ, *Haliday* . 223, 230
Mygnimia, *Sm.* 32
—— Aspasia, *Sm.* 32
—— exasperata, *Sm.* 32
—— fervida, *Sm.* 32
—— intrepida, *Sm.* 33
—— iridipennis, *Sm.* 32
—— opulenta, *Sm.* 32
Myrmica, *Latr.* 21, 120
—— incerta, *Sm.* 21
—— mœsta, *Sm.* 21
—— poneroides, *Sm.* 21
—— umbripennis, *Sm.* 21
Myrmicidæ, Distribution of the . 119
Neptunea, *Link* 106
—— æstuosa, *Gould* 107
—— antiqua, *Linn.* 106
—— despecta, *Linn.* 107
—— fornicata, *Fabr.* 106
—— lurida, *A. Ad.* 107
Nertobriga, *Walk.* 75
—— reversa, *Walk.* 75
Nerua, *Walk.* 223, 232
—— scenopinoides, *Walk.* . 223, 232
Nolasena, *Walk.* 75
—— dulcissima, *Walk.* 76
Nomada, *Fabr.* . . . 47, 114, 124
—— conspicua, *Sm.* 47

Page

Nomada insularis, *Sm.* 47
Nomia, *Latr.* 45, 113, 124
—— bidentata, *Sm.* 45
—— concinna, *Sm.* 45
—— dentata, *Sm.* 45
—— florea, *Sm.* 45
—— iridescens, *Sm.* 45
—— metallica, *Sm.* 45
—— simillima, *Sm.* 46
Notiphila, *Fallén* 222
—— ortalidoides, *Walk.* 222
—— unicolor, *Walk.* 222
Notodontidæ, *Steph.* 197
Nyctipao, *Hübn.* 177
—— crepuscularis, *Linn.* . . . 177
Obrapa, *Walk.* 204
—— perilampoides, *Walk.* . . . 204
Ochromyia, *Macq.* 216, 236
—— promittens, *Walk.* . 216, 236
Ochthera, *Latr.* 238
—— innotata, *Walk.* 238
Odontomachus, *Latr.* . . . 19, 119
—— aciculatus, *Sm.* 19
—— cephalotes, *Sm.* 19
—— malignus, *Sm.* 19
—— nigriceps, *Sm.* 19
—— simillimus, *Sm.* 19
—— tyrannicus, *Sm.* 19
Odynerus, *Latr.* 39, 123
—— agilis, *Sm.* 39
—— conspicuus, *Sm.* 40
—— fallax, *Sm.* 40
—— laboriosus, *Sm.* 41
—— sobrinus, *Sm.* 40
Œcophylla, *Sm.* 17, 119
—— smaragdina, *Sm.* 17, 119
Ommatius, *Illiger* . . . 208, 224, 232
—— bacchoides, *Walk.* 232
—— invehens, *Walk.* 224
—— Lucifer, *Walk.* 224
—— nanus, *Walk.* 208
—— noctifer, *Walk.* 208
—— retrahens, *Walk.* . . 208, 233
Ommatophora, *Guén.* 177
—— luminosa, *Cram.* 177
Ommatophoridæ, *Guén.* 177
Ophideres, *Boisd.* 176
—— fullonica, *Linn.* 176
Ophideridæ, *Guén.* 176
Ophisma, *Guén.* 179
—— inversa, *Walk.* 179
—— lutea, *Walk.* 180
—— rubida, *Walk.* 179
—— velata, *Walk.* 180
Ophiusa, *Ochs.* 182
—— fulvotænia, *Guén.* 182
—— Joviana, *Cram.* 182
Ophiusidæ, *Guén.* 179
Ornithomyia, *Olfers* . . . 222, 238
—— Batchianica, *Walk.* . 222, 238

Page

Oroba, *Walk.* 81
—— turrigens, *Walk.* 81
Ortalides, *Haliday* . . 219, 227, 237
Ortalis, *Fallén* 219
—— leucomera, *Walk.* 219
Orthopterous Insects, A. Murray on the early Stages of Development of. 97
Oryssus 124
Osca, *Walk.* 73
—— guttulosa, *Walk.* 73
Osmia 113
Parthenia, *Lowe* 3
—— cælata, *A. Ad.* 4
—— fovcolata, *A. Ad.* 4
—— littoralis, *A. Ad.* 4
—— monocycla, *A. Ad.* 4
—— pagodula, *A. Ad.* 4
—— punctigera, *A. Ad.* 4
—— pusio, *A. Ad.* 4
—— semiplicata, *A. Ad.* . . . 4
—— spirata, *A. Ad.* 4
Pelopœus, *Latr.* 34, 111
—— Bengalensis, *Dahlb.* . . . 34
—— lætus, *Sm.* 34
—— murarius, *Sm.* 34
—— spirifex, *Linn.* (sp.) . . . 34
Penicillaria, *Guén.* 65
—— quadrinotata, *Walk.* . . . 65
Penza, *Walk.* 56
—— puncticeps, *Walk.* 56
Pheidole, *Westw.* 22
—— megacephala, *Sm.* 22
—— mordax, *Sm.* 22
—— penetralis, *Sm.* 23
—— singularis, *Sm.* 22
Philanthidæ 37
Philanthus 112, 122
Phumana, *Walk.* 164
—— canescens, *Walk.* 164
Phyllodes, *Boisd.* 176
—— semilinea, *Walk.* 176
Pimpla, *Fabr.* 8
—— apicalis, *Sm.* 9
—— arrogans, *Sm.* 8
—— braconoides, *Sm.* 8
—— caudata, *Sm.* 10
—— destructor, *Sm.* 9
—— incisa, *Sm.* 9
—— inimica, *Sm.* 10
—— insidiator, *Sm.* 9
Pison, *Spin.* 35, 122
—— nitidus, *Sm.* 35
—— pallidipalpis, *Sm.* 35
Platystoma, *Latr.* 228, 237
—— protensa, *Walk.* 228
—— tarsalis, *Walk.* 237
Plecia, *Hoffm.* 202
—— dorsalis, *Walk.* 202
Plusia, *Ochs.* 69

Page

Plusia albosignata, *Walk.* . . . 72
—— detegens, *Walk.* 72
—— duplicilinea, *Walk.* . . . 70
—— ferripunctum, *Walk.* . . . 69
—— inaperta, *Walk.* 71
—— inornata, *Walk.* 71
—— invicta, *Walk.* 72
—— niveiplaga, *Walk.* 71
—— pallida, *Walk.* 70
—— stipata, *Walk.* 70
—— verticillata, *Guén.* 69
Plusidæ, *Boisd.* 69
Podomyrma, *Sm.* 19
—— basalis, *Sm.* 19
—— lævissima, *Sm.* 20
—— ruficeps, *Sm.* 20
Polistes, *Latr.* 43
—— diabolicus, *Sauss.* 43
—— elegans, *Sm.* 43
—— fastidiosus, *Sauss.* 43
—— nigrifrons, *Sm.* 43
—— Pieteti, *Sauss.* 43
—— Smithii, *Sauss.* 43
—— stigma, *Fabr.* 43
—— tepidus, *Fabr.* 43
Polyara, *Walk.* 221
—— insolita, *Walk.* 221
Polybia, *Sauss.* 43, 113
—— limatula, *Sm.* 43
Polyrhachis, *Sm.* 13, 118
—— Acasta, *Sm.* 14
—— Alpheus, *Sm.* 14
—— bihamatus, *Sm.* 13
—— Bubastes, *Sm.* 15
—— Busiris, *Sm.* 13
—— Diaphantus, *Sm.* 13
—— dives, *Sm.* 13
—— Dolomedes, *Sm.* 14, 16
—— Euryalus, *Sm.* 16
—— Ithonus, *Sm.* 13
—— marginatus, *Sm.* 13
—— nigriceps, *Sm.* 17
—— Orsyllus, *Sm.* 14
—— paromalus, *Sm.* 15
—— paxillus, *Sm.* 17
—— rufofemoratus, *Sm.* 13
—— rugifrons, *Sm.* 13
—— sculpturatus, *Sm.* 14
—— scutellatus, *Sm.* 13
—— sericatus, *Sm.* 14
—— serratus, *Sm.* 14
—— sexspinosus, *Sm.* 13
—— Sparaxes, *Sm.* 16
—— Trophimus, *Sm.* 14
—— Valerus, *Sm.* 14
—— Xiphias, *Sm.* 16
Pompilidæ, *Leach.* 29
——, Distribution of . . . 110, 121
Pompilus, *Fabr.* 29, 121
—— bicolor, *Fabr.* 29

Page

Pompilus deprædator, *Sm.* . . . 29
—— jucundus, *Sm.* 29
—— vigilans, *Sm.* 29
Ponera, *Latr.* 17, 119
—— cuprea, *Sm.* 17
—— læviceps, *Sm.* 17
—— parallela, *Sm.* 17
—— purpurea, *Sm.* 18
—— tortuolosa, *Sm.* 18
Poneridæ, *Sm.* 17
——, Distribution of the . . . 119
Potamophora, *Guén.* 177
—— ferrifracta, *Walk.* 177
Poticara, *Walk.* 227
—— tricurvata, *Walk.* 227
Priene, *H. & A. Ad.* 106
—— cancellata, *Lam.* 106
—— Oregonensis, *Say* 106
Priocnemis, *Schiödte* 30
—— adustus, *Sm.* 30
—— fervidus, *Sm.* 30
—— flavipennis, *Sm.* 30
—— pulcherrimus, *Sm.* 30
Prosena, *St. Farg.* . 214, 226, 235
—— argentata, *Walk.* 214
—— coacta, *Walk.* 235
—— pectoralis, *Walk.* 226
—— secedens, *Walk.* 235
Prosopis, *Fabr.* 44, 113
—— apicata, *Sm.* 44
—— imperialis, *Sm.* 44
—— lusoria, *Sm.* 44
Psen, *Latr.* 37, 122
—— petiolatus, *Sm.* 37
Pseudomyrma, *Guér.* 20
—— carbonaria, *Sm.* 20
—— læviceps, *Sm.* 20
Psilides, *Walk.* 222, 230
Psilopus, *Meig.* 209, 234
—— benedictus, *Walk.* . . 209, 234
—— egens, *Walk.* 234
—— lucigena, *Walk.* 209
—— moderatus, *Walk.* 209
—— seticornis, *Walk.* 234
—— subrectus, *Walk.* 209
—— superans, *Walk.* 209
Pusia, *Swains.* 201
—— amabilis, *Rve.* 201
—— analogica, *Rve.* 201
—— Bronni, *Dkr.* 201
—— cavea, *Rve.* 201
—— dermestina, *Lam.* 201
—— Kraussii, *Dkr.* 201
—— rubra, *Brod.* 201
Pustularia, *Swains.* 94
—— staphylea, *Linn.* 94
ramidella 1
rellia, *Desv.* 215, 236
— obtrusa, *Walk.* 236
— porphyricola, *Walk.* . . . 215

Page

Pyrgulina, *A. Ad.* 4
—— bellula, *A. Ad.* 5
—— Brenda, *A. Ad.* 4
—— casta, *A. Ad.* 4
—— concinna, *A. Ad.* 5
—— decussata, *A. Ad.* 5
—— elegantula, *A. Ad.* 4
—— fenestrata, *A. Ad.* 5
—— Minna, *A. Ad.* 4
—— miranda, *A. Ad.* 5
—— pulchella, *A. Ad.* 5
—— pura, *A. Ad.* 5
—— pygmæa, *A. Ad.* 5
—— tantilla, *A. Ad.* 5
Radius, *Schum.* 96
—— acuminatus, *Sow.* 96
—— obtusus, *Sow.* 96
—— recurvus, *Sow.* 96
—— scitulus, *A. Ad.* 96
—— subreflexus, *Sow.* 96
Remigia, *Guén.* 183
—— Archesia, *Cram.* 183
—— bendioides, *Walk.* 184
—— frugalis, *Fabr.* 183
—— intracta, *Walk.* 183
—— Zeta, *Walk.* 183
Remigiidæ, *Guén.* 183
Remusia, *Walk.* 173
—— hirtissima, *Walk.* 173
Rhopalum 112
Rhynchium, *Spin.* 39, 123
—— hæmorrhoidale, *Fabr.* . . . 39
—— metallicum, *Sauss.* 39
—— parentissimum, *Sauss.* . 39
Rhyssa, *Grav.* 10
—— vestigator, *Sm.* 10
—— viator, *Sm.* 10
Rusicada, *Walk.* 78
—— basiscripta, *Walk.* 79
—— lignigera, *Walk.* 78
Rutilia, *Desv.* . . . 225, 235, 238
—— angustipennis, *Walk.* . . 235
—— ignobilis, *Walk.* 238
—— lucigena, *Walk.* 225
—— moneta, *Gerst.* 225
Salduba, *Walk.* 203
—— arcolaris, *Walk.* 204
—— gradiens, *Walk.* 203
Salius, *Fabr.* 33
—— malignus, *Sm.* 33
Salmo Salar, W. C. M'Intosh on the Food and Parasites of . . 145
Sarcophaga, *Meig.* 214
—— brevis, *Walk.* 236
—— immotata, *Walk.* 214
Sarcophagides, *Walk.* . . 214, 236
Sargus, *Walk.* 205
—— quadrifasciatus, *Walk.* . . 205
Sarthida, *Walk.* 80
—— signifera, *Walk.* 81

Page

Scabricula, *Swains.* 198
—— asperulata, *A. Ad.* 199
—— pretiosa, *Rve.* 199
—— punctolirata, *A. Ad.* . . . 199
—— scabricula, *Linn.* 198
Sciara, *Meig.* 230
—— ponderosa, *Walk.* 230
Sciomyza, *Fallén.* 219
—— leucomelana, *Walk.* . . . 219
Scleroderma, *Latr.* 27
—— modesta, *Sm.* 27
Scolia, *Fabr.* 27, 121
—— agilis, *Sm.* 29
—— aureicollis, *St. Farg.* . . . 29
—— aurulenta, *Sm.* 29
—— captiva, *Sm.* 28
—— dimidiata, *Guér.* 29
—— dubia, *Sm.* 28
—— fimbriata, *Burm.* 29
—— fulgidipennis, *Sm.* 28
—— insularis, *Sm.* 27
—— larradiformis, *Sm.* 28
—— morata, *Sm.* 28
Sepsides, *Walk.* 221, 230
—— nitida, *Sm.* 28
Scoliadæ, Distribution of the . . 121
Scopulipedes, Distribution of the . 115
Selenis, *Guén.* 189
—— æqualis, *Walk.* 189
—— inæqualis, *Walk.* 189
—— vacillans, *Walk.* 189
Selma, *A. Ad.* 91
—— succiniola, *A. Ad.* 91
Silbomyia, *Macq.* 215, 227
—— costalis, *Walk.* 215, 227
—— decrescens, *Walk.* 215
Sipho, *Klein* 107
—— dilatatus, *Q. & G.* 107
—— plicatus, *A. Ad.* 107
—— Sabinii, *Gray* 107
Smith, Fred. Catalogue of Hymenopterous Insects collected by Mr. A. R. Wallace, in the islands of Mysol, Ceram, Waigiou, Bouru, and Timor 6
——. Notes on the Geographical Distribution of the Aculeate Hymenoptera collected by Mr. A. R. Wallace in the Eastern Archipelago 109
Solenopsis, *Westw.* 21
—— calida, *Sm.* 22
—— cephalotes, *Sm.* 21
—— laboriosa, *Sm.* 22
Spersara, *Walk.* 174
—— glaucopoides, *Walk.* . . . 175
Spheeodes 124
Sphegidæ, *Leach* 33
Sphegidæ, Distribution of . 110, 121
Sphex, *Fabr.* 33, 121

Page

Sphex argentata, *Sm.* 33
—— diabolicus, *Sm.* 33
—— ferox, *Sm.* 33
—— formosa, *Sm.* 33
—— sericea, *Sm.* 33
—— tyrannica, *Sm.* 33
Spiders and Insects, J. Blackwall on several Remarkable Facts in the Physiology of the 154
Stauropus, *Germ.* 197
—— indeterminatus, *Germ.* . . 197
Steiria, *Walk.* 173
—— æquilinea, *Walk.* 174
—— albistriga, *Walk.* 174
—— ferrifera, *Walk.* 173
—— humeralis, *Walk.* 174
—— repleta, *Walk.* 173
—— signifera, *Walk.* 173
—— trajiciens, *Walk.* 173
Stratiomidæ, *Haliday* . 203, 223, 232
Stratiomys, *Geoff.* 203
—— restricta, *Walk.* 203
Strigatella, *Swains.* 199
—— amphorella, *Lam.* 199
—— scutulata, *Chemn.* 199
Strombidæ 92
Strumeta, *Walk.* 219, 227
—— concisa, *Walk.* 227
—— helomyzoides, *Walk.* . . . 219
Sympis, *Guén.* 184
—— rufibasis, *Guén.* 184
Syrphidæ, *Leach* . . . 210, 225, 234
Syrphus, *Fabr.* . . . 212, 225, 234
—— ægrotus, *Fabr.* . . 212, 225, 234
—— ericetorum, *Fabr.* 212
Tabanidæ, *Leach.* 205, 232
Tabanus, *Linn.* 205, 232
—— exagens, *Walk.* 205
—— facilis, *Walk.* 205
—— obscuratus, *Walk.* 232
—— sylvioides, *Walk.* 205
Tachinides, *Walk.* . . . 213, 235
Tachytes 111
Talariga, *Walk.* 190
—— capaeior, *Walk.* 190
Tenthredinidæ, Distribution of the 124
Terebellum, *Klein* 92
—— terebellum, *Linn.* 92
Tetralonia 115
Thacona, *Walk.* 169
—— costivitta, *Walk.* 169
Thalestria 115
Thereva, *Latr.* 224
—— congrua, *Walk.* 224
Therevites, *Walk.* 224
Thermesia, *Hübn.* 184
—— antecedens, *Walk.* 184
—— erassiuscula, *Walk.* . . . 186
—— discontenta, *Walk.* 185
—— finipalpis, *Walk.* 184

Page

Thermesia metagona, *Walk.* . . 185
—— nigripalpis, *Walk.* 187
—— noctinix, *Walk.* 185
—— plagifera, *Walk.* 187
—— poaphiloides, *Walk.* . . . 186
—— ruficeps 186
—— sparsa 187
Thermesidæ, *Guén.* 184
Thynnidæ, *Erichs.* 25
Thynnus, *Fabr.* 25, 120
—— insularis, *Sm.* 26
—— lugubris, *Sm.* 25
—— placidus, *Sm.* 26
—— pullatus, *Sm.* 26
Tiphia, *Fabr.* 25
—— intrudens, *Sm.* 25
Tipulidæ, *Haliday* . . . 202, 231
Tipula infindens, *Walk.* 231
Toxocampa, *Guén.* 79
—— decernens, *Walk.* 79
—— nigripalpis, *Walk.* 80
—— obliterans, *Walk.* 79
Toxocampidæ, *Guén.* 97
Trichoprosopa, *Macq.* 213
—— divisa, *Walk.* 213
Trichotropidæ 92
Trichotropis, *Brod. & Sow.* . . . 92
—— bicarinata, *Br. & Sow.* . . . 92
—— borealis, *Brod. & Sow.* . . 93
—— cancellata, *Hinds* 93
—— cedo-nulli, *A. Ad.* 93
—— conica, *Möll.* 93
—— inermis, *Hinds* 93
—— insignis, *Midd.* 93
Trigona 117, 124
Trigonopsis 111
Tritonidea, *Swains.* 108
—— balteata, *Reeve* 108
—— Proteus, *Reeve* 108
Trivia, *Gray* 94
—— globosa, *Gray* 94
—— grando, *Gask.* 94
Trupanea, *Macq.* 207
—— transacta, *Walk.* 207

Page

Trypeta, *Meig.* 229, 238
—— melaleuca, *Walk.* 238
—— multistriga, *Walk.* 229
Trypoxylon, *Latr.* 35, 112
—— gracillimum, *Sm.* 35
—— placidum, *Sm.* 35
Turriculinæ 200
Typhlopone 119
Varnia, *Walk.* 69
—— miniata, *Walk.* 69
Veia, *Walk.* 160
—— homopteroides 161
Vescisa, *Walk.* 191
—— commoda, *Walk.* 191
Vespa, *Linn.* 43, 123
—— affinis, *Fabr.* 43
—— Alduini, *Sauss.* 43
—— Philippinensis, *Sauss.* . . . 44
—— unicolor, *Sm.* 44
Vespidæ, *Steph.* . . . 41, 112, 122
Volva, *Bolt.* 96
—— volva, *L.* 96
Walker, Francis. Catalogue of Heterocerous Lepidopterous Insects collected at Sarawak in Borneo, by Mr. A. R. Wallace, with Descriptions of New Species. (*Continued.*) 49, 160, 181
——. Catalogue of the Dipterous Insects collected in Waigiou, Mysol, and North Ceram by Mr. A. R. Wallace, with Descriptions of New Species . . 202
Wasps, Social 41
——, Solitary 37
Xanthodes, *Guén.* 49
—— intersepta, *Guén.* 49
Xarnuta, *Walk.* 227
—— leucotelus, *Walk.* 227
Xylocopa, *Latr.* 48, 116
—— æstuans, *Linn.* (sp.) . . . 48
—— perforator, *Sm.* 48
—— provida, *Sm.* 48
—— unicolor, *Sm.* 48

THE END.

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